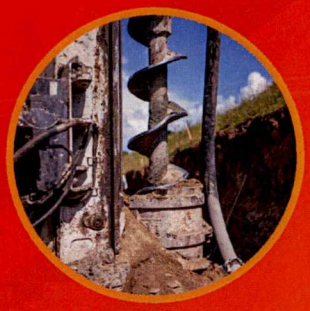


BUREAU OF UNDERGROUND STORAGE TANK REGULATIONS (BUSTR) ADDITIONAL EVALUATION REPORT

FORMER HUNTS SOHIO, ELMORE, OHIO

SME Project Number: 066708.01.004.005

August 26, 2015

SME

SME

1 North Commerce Park Dr.
Suite 318
Cincinnati, OH 45215-3187

T (513) 898-9430

www.sme-usa.com

August 26, 2015

Mr. Rick Krueger, PE, PhD
Bureau of Underground Storage Tank Regulations
8895 East Main Street
Reynoldsburg, Ohio 43068

RE: Former Hunt's Sohio
408 Rice Street, Elmore, Ohio
BUSTR Release No. 62000042-N00001

Dear Mr. Krueger:

The enclosed report is provided in response to your December 3, 2014, summary regarding conditions at the former Hunt's Sohio site ("Property") and the actions needed to obtain a No Further Action status. SME has completed the requested work and the data supports a No Further Action determination for the Property.

The work was performed using United States Environmental Protection Agency (USEPA) Brownfield Assessment grants. To be eligible for these grants, the Village of Elmore (Village) cannot be the responsible party. BUSTR concurred that the Village is not the responsible party when they granted eligibility to the Property.

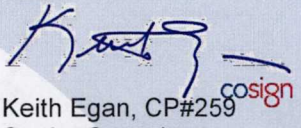
The Property is safe for redevelopment which the Village intends to support. The Property is safe and there are no obstructions to redevelopment because none of the health-based standards are exceeded and the underground storage tanks have been removed. The Village has supported the redevelopment of the Property by participation in the USEPA grant program.

Now that the Property is safe for redevelopment, the Village will no longer support further investigation or remediation. In the event you disagree that the Property meets the criteria for issuing a No Further Action status, we respectfully request you pursue the responsible party for addition investigation and or remediation.

If you have questions regarding the site or this report, feel free to call me at (513) 898-9430.

Sincerely,

SME



Keith Egan, CP#259
Senior Consultant

Enclosure

Distribution: Mayor Matt Damschroder, Village of Elmore
Ms. Karla Auker, USEPA

TABLE OF CONTENTS

FIGURES

AddEval+066708.01.004.005+08262015

APPENDIX A
SAMPLING AND ANALYSIS PLAN

APPENDIX B
SOIL BORING LOGS

APPENDIX C
LABORATORY DATA REPORTS

APPENDIX D
GEOTECHNICAL REPORTS

APPENDIX E
PROUCL DOCUMENTATION

APPENDIX F
DWSPA DOCUMENTATION

APPENDIX G
BUSTR SPREADSHEET

APPENDIX H
TPH SATURATION DETERMINATION

APPENDIX I
BUSTR LETTERS

AddEval+066708.01.004.005+08262015

1.0 INTRODUCTION

We prepared this report to document the results of the additional environmental evaluation of the former Hunt's Sohio property, located at 408 Rice Street in the Village of Elmore, Ottawa County, Ohio, hereafter referred to as the "Property". The Property location is shown on Figure 1.

The assessment activities were funded by Ottawa County's United States Environmental Protection Agency (USEPA) Brownfields Assessment Grant for hazardous substances (Cooperative Agreement No. BF-00E01066-0). The Bureau of Underground Storage Tank Regulations (BUSTR) confirmed site eligibility for funding on May 20, 2015. We conducted the assessment in accordance with the Bureau of Underground Storage Tank Regulations (BUSTR) memo dated December 3, 2014, our Sampling and Analysis Plan (SAP), dated June 12, 2015, and Quality Assurance Project Plan (QAPP) for Ottawa County. The QAPP was approved by the USEPA on July 9, 2010 and updated yearly and the SAP was approved by the USEPA on July 1, 2015. The SAP is included in Appendix A. The QAPP is available upon request.

1.1 SITE DESCRIPTION AND BACKGROUND

The Property consists of approximately 0.17 acres of land consisting of a paved and gravel parking lot, and grass covered areas. The Property was most recently occupied by an automobile repair facility, but is currently vacant. The current general Property features are depicted on Figure 2.

In 2004, the Village of Elmore (Village) informed BUSTR that there were several petroleum underground storage tanks (USTs) which had not been used in several years at a Property owned by Mr. James Hunt. Following Mr. Hunt's death in 2005, the Village of Elmore obtained Ohio Environmental Protection Agency (Ohio EPA) funds and performed a Targeted Brownfield Assessment of the Property. The assessment found evidence of soil contamination at the site.

Using a USEPA Site-Specific Brownfield Assessment Grant to support the redevelopment of the Property, five underground storage tanks (USTs) were removed in 2009 by Burgess & Niple on behalf of the Estate of Mr. Hunt, and a Closure Assessment Report was submitted to BUSTR. The Closure Report stated that approximately 640 cubic yards of petroleum contaminated soil were excavated and disposed at the Petro Environmental landfill in Lodi, OH. Eleven soil samples were collected from the final excavation cavity floor and sidewalls, and laboratory analyses indicated that one of the 11 samples contained heavy distillate petroleum compounds (total petroleum hydrocarbons or TPH) above the allowable Action Levels for this site. Based on these results, a Tier 1 Source Investigation was required per Ohio Administrative Code 1301:7-9-13. Sample locations for the closure and Tier 1 assessments are shown on Figure 2.

A Tier 1 Investigation was performed in 2011 by Burgess & Niple. The Tier 1 Investigation included installation of 11 soil borings, three of which were then converted into groundwater monitoring wells. The Tier 1 Investigation identified the following issues related to the potential risks to human health and the environment at this site:

1. Two post-excavation soil samples contained petroleum chemicals above the risk-based Action Levels for this site. The chemical which exceeded Tier 1 Action Levels was benzene (a human carcinogen) at a concentration exceeding the default soil leaching to groundwater action level. Benzene was not present at a concentration presenting a health risk via direct contact with soils.

2. The Former Hunt's Sohio site is on the edge of the Village of Elmore's Drinking Water Source Protection Area (DWSPA). Groundwater is considered a drinking water resource and is currently being used for drinking purposes in the Village[1].

3. Groundwater samples collected from the site and adjacent properties generally contain low or non-detectable concentrations of petroleum chemicals.

The Closure and Tier 1 reports were funded by a USEPA grant. The funds have been expended although BUSTR is requiring additional work to obtain a No Further Action status for the USTs as outlined in the BUSTR Site Summary memo dated December 3, 2014. As such, the Village requested that the Ottawa Regional Planning Commission fund the remaining work using their grant funds and the request was approved. To obtain eligibility, BUSTR had to determine the Village was not the responsible party.

1.2 PURPOSE

We designed the scope of this evaluation to further evaluate the soils and TPH levels at the Property. The action levels that were exceeded are based on soil type. The previous consultant based the soil type on one sample, collected at a depth of 16 to 18 feet below ground surface (bgs). The soil type was listed as a silty (lean) clay. The soil impact was found at a depth of 6 to 8 feet below grade. A boring log from a nearby boring indicates the soil from 6 to 16 feet bgs may be a fat clay. If so, the action levels have not been exceeded at the Property.

In a December 2014 memorandum, BUSTR listed the following activities that needed to be performed to Achieve "No Further Action" status for the Property

1. Additional soil samples must be collected and analyzed for geotechnical parameters to calculate a site-specific target level for benzene (for the soil leaching to drinking water exposure pathway).

2. Additional soil samples must be collected and analyzed for TPH-ORO to calculate a 95% UCL for heavy distillate TPH. BUSTR guidance documents recommend collecting and analyzing a minimum of twelve soil samples from the source area(s) for this statistical calculation.

[1] SME could not verify from the documentation provided by Burgess & Niple the actual location of the Property relative to the DWSPA.

2.0 SCOPE OF ASSESSMENT

We designed the proposed assessment activities to obtain the data requested by BUSTR. The geotechnical data can serve two purposes. The BUSTR action levels are based on soil type. Previous consultants used the Class 2 soil type because they determined the impacted soil was a silty clay based on a visual analysis of soil type from intervals that were not impacted. A review of the boring logs indicates the impacted zone and the zone where soil leaching would occur may be Class 3. If so, none of the action levels are exceeded. We compared the soil analytical data to the BUSTR action levels to evaluate if the Property warrants remediation to obtain a No Further Action Status from BUSTR. We also assessed the data to ascertain if the Property presents a potential risk to future receptors if remediation is not performed.

SME personnel advanced a total of five direct-push soil borings (SME-01 through SME-05; Figure 2) on the Property. We collected soil samples from the soil borings for visual and laboratory classification, field screening for evidence of contamination, and/or chemical analyses.

We submitted the soil samples to EA Group for analyses of total petroleum hydrocarbons (TPHs), and total organic carbon (TOC). Additional soil samples were submitted to SME's geotechnical laboratory for analyses of grain size and Atterburg limits. We selected these target analytes based on BUSTR's request. The following summarizes the samples collected and analyzed for BUSTR chemicals-of-concern during this assessment:

Sample Boring	Sample Depth (ft bgs)	Analytical	Rationale
SME-01	3-5	TOC	Interval of no previous impact.
	8-9	TPH	Depth where maximum concentration of TPH was measured.
	10-12	TPH	Interval below suspected release point.
SME-02	8-9	TPH	Depth where maximum concentration of TPH was measured.
	10-12	TPH	Interval below suspected release point.
SME-03	2-4	TOC	Interval of no previous impact.
	8-9	TPH	Depth where maximum concentration of TPH was measured.
	10-12	TPH	Interval below suspected release point.
SME-04	9-10	TOC	Interval of no previous impact.
SME-05	9-10	TOC	

Additional discussion of the rationales for sample locations, sample depths and target analytes are described in the SAP (Attachment A).

3.0 PROCEDURES

Procedures for the direct-push sampling activities, soil gas sampling, temporary groundwater monitoring well installation and sampling, equipment decontamination, and chemical analyses are summarized in the following subsections. Detailed operating procedures are attached to the QAPP, which will be provided upon request. We completed the soil borings and collected soil samples on July 27, 2015.

3.1 SOIL SAMPLING

Soil borings SME-01 through SME-05 were advanced to a depth of 16 feet below ground surface (bgs) using hydraulically driven, direct-push, coring equipment mounted on an all-terrain vehicle (ATV). Soil boring soil samples were collected continuously at direct-push locations using a four-foot long, (2.25-inch outer diameter) GeoProbe® Macro Sampler fitted with disposable acetate liners. We visually classified the soil samples in accordance with the ASTM D2488 and screened soil for the presence of ionizable VOCs using a photoionization detector (PID) equipped with a 10.6 eV lamp. PID screening was conducted by collecting a soil sample from continuous intervals of no more than two feet, placing it into a sealable Ziploc® bag, inserting the tip of the PID into the headspace of the bag, and recording the screening result. The lower measurement limit of the PID was one part per million by volume (ppmv). At some locations, Shelby tunes were pushed to obtain geotechnical samples for vertical hydraulic conductivity analysis. The results of our field screening are provided on the soil boring logs in Appendix B.

We collected soil samples for analyses of TPH and TOC by homogenizing the sample in a new plastic ZipLoc™ bag, then removing an aliquot and placing it directly into an unpreserved, 4-ounce, glass jar. Pre-cleaned sample containers were supplied by the laboratory. Soil samples were collected and analyzed in general accordance with our standard operating procedures. Samples for geotechnical analysis were cut from the core and stored in glass jars or were collected in Shelby tubes which were submitted to the geotechnical laboratory.

3.2 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

3.2.1 FIELD QA

SME's field representative wore a new pair of disposable nitrile sampling gloves during collection of each sample to minimize cross-contamination. New, disposable acetate liners were used for collection of each soil core.

We decontaminated soil sampling equipment (sample spoon, shovel, etc.) before each use with a laboratory-grade detergent and rinsed with distilled water. Direct-push soil sampling equipment was decontaminated before each use with a high-pressure, hot water pressure washer.

EA Group and SME supplied the containers used for sample collection. EA Group supplied the containers for chemical analysis and SME provided the containers for geotechnical analysis. The sample jars were pre-cleaned and contained the appropriate preservative. After sample collection, the containerized samples were kept cool (i.e., kept on ice or refrigerated) until delivery to the analytical laboratory. SME's field representative followed chain-of-custody procedures to document the sample handling sequence. Field instrument calibration, sample handling and custody requirements, and laboratory analytical methods, analysis reporting limits (RLs), QA/QC procedures, and reporting protocols were consistent with those described in the USEPA-approved QAPP applicable to this assessment.

3.2.2 FIELD QC

We collected duplicate soil samples to evaluate matrix homogeneity and the precision of sampling activities. We did not collect trip blank samples to evaluate the potential for cross-contamination during sample collection, transport, and storage because volatile organic compounds were not a chemical of concern.

3.3 CHEMICAL ANALYSES

We submitted 5 soil samples and 1 QA/QC samples (duplicate soil sample) to EA Group (EA) of Mentor, Ohio for chemical analyses of:

- total petroleum hydrocarbons (TPHs) diesel range organics (DRO), and
- total organic carbon (TOC).

EA and SME analyzed the samples using the following USEPA methods:

- TPHs DRO – Method 8015,
- TOC – Walkley Black method,
- Soil Type – ASTM Methods D422 and D4318, and
- Vertical Hydraulic Conductivity – ASTM Method D5084.

The full list of chemical analytical methods and method reporting limits, and the chain of custody documentation, is attached in Appendix C.

4.0 RESULTS

The surface and subsurface conditions encountered during soil boring activities, and the results of chemical analyses, are described in the following subsections.

4.1 SUBSURFACE CONDITIONS

Soil samples were visually classified in general accordance with ASTM D2488 and also classified by the lab using the ATSM methods described in Section 3.4. Detailed descriptions of the soil conditions encountered at each boring are documented in the Boring Logs in Appendix B. The subsurface conditions encountered are summarized below and are based on our investigation as well as previous investigations.

The surface materials are underlain by a silty clay transitioning into a more plastic clay. This transition occurs at approximately 8 to 12 feet below ground surface (bgs). Geotechnical analysis revealed the soils at the Property to be a lean clay (CL) which is a BUSTR Class 2 soil (Appendix D). The average water content was over 30% which is typical for a lean clay trending to a fat (plastic) clay. The unsaturated Vertical Hydraulic Conductivity ranged from 1.14E-08 cm/sec to 2.0E-08 cm/sec. Groundwater was not encountered during this investigation but in the past groundwater has been observed in a coarse sand seam at an approximate depth of 16 bgs. No odors, staining, or PID measurements greater than one part per million (ppm) were noted during field screening of the soil samples.

4.2 RESULTS OF CHEMICAL ANALYSES

Results of chemical analyses performed on soil samples are summarized in the following paragraphs. There were no detections of TPH (C_{20}-C_{34}) in any of the soil samples collected. This is consistent with past results where out of the 22 samples analyzed for this fraction of TPH, only 5 samples had detectable levels of TPH. Except for the one sample where the TPH concentration was 21,300 mg/kg, the other 4 samples had concentrations less than 9 mg/kg. The Walkley Black TOC values ranged from 0.19% to 0.4%. Laboratory analysis reports are included in Appendix C.

4.3 DATA VERIFICATION/VALIDATION AND USABILITY

We evaluated the representativeness of the data collected during our subsurface assessment to determine if the data set was valid and of usable quality. Our discussion of quality control samples and our conclusions are summarized below. The laboratory QC results are detailed in the Case Narrative included in Appendix C.

4.3.1 FIELD QC

The relative percent differences (RPDs) in the results from analyses of target analytes in the duplicate soil samples were within the project precision limits of 50% for soil.

4.3.2 LABORATORY QC

EA Group reported that the lab met all QA/QC criteria.

4.3.3 PROJECT OBJECTIVES AND DATA USABILITY

The data set generated is of usable quality and meets the Property-specific objectives.

5.0 BUSTR EVALUATION

5.1 REPRESENTATIVE SOIL CONCENTRATIONS

As requested by BUSTR, the 95% UCL was calculated for TPH and benzene using all of the sample results collected to date. There are 22 TPH results and 32 benzene results. The 95% UCL was calculated using the USEPA program, ProUCL, which is mandated by the Ohio VAP for use in calculating UCLs and recommended by BUSTR. ProUCL documentation is provided in Appendix E.

The 95% UCL for TPH is 7,249 mg/kg while the 95% UCL for benzene is 0.168 mg/kg. The UCLs were calculated using all the results regardless if ProUCL determined the result to be outliers. Outliers were the maximum value of TPH (21,300 mg/kg) and the elevated non-detect value (<0.692 mg/kg) for benzene at sample location GP-9. The 95% UCL are less than BUSTR closure soil migration to groundwater action levels for Class 2 soil. This is consistent with the groundwater results where the chemicals of concern are less than the drinking water action level over 20 years since the USTs were last used.

The 95% UCLs for TPH and benzene are less than the default closure levels for Class 2 soil. The one soil sample containing TPH above the default closure levels could not be duplicated, was determined to be an outlier, and is not representative of the actual impact and potential threat to groundwater. Based on the representative soil concentrations, a No Further Action status should be granted for the Property.

5.2 DRINKING WATER DETERMINATION

The Tier I investigation conducted by Burgess & Niple determined that the groundwater at the Property was drinking water based on being located within the Drinking Water Source Protection Area (DWSPA). The map they used for this determination was developed by Burgess & Niple and not the State. The State generated map is provided in Appendix F. The Property is outside of the DWSPA. Using the BUSTR Tier 1 Drinking Water determination procedure provided in the Tier 1 Investigation Report Form, the groundwater is not drinking water because the criteria for Item 6 have been met, there are no potable water wells within 300 feet of the Property and 100 percent of the properties are connected to the municipal water system.

The soil is Class 2 and the Tier 1 benzene action level for Class 2 soils for soil leaching to non-drinking water is 21.60 mg/kg. The maximum benzene result in soil is 0.376 mg/kg. The action level is not exceeded and the benzene in soil does not pose a threat to groundwater. Based on the Drinking Water Determination and the concentrations of chemicals of concern, a No Further Action status should be granted for the Property.

5.3 DRINKING WATER ACTION LEVEL

The Property is just outside the DWSPA. In the event that the groundwater was considered drinking water, SME used the BUSTR Soil to Groundwater spreadsheet to calculate the soil action level (Appendix G). The default values were used with the following exceptions:

The soil type was determined to be lean clay or a Class 2 soil type. The highest vertical hydraulic conductivity is 2.0E-08 cm/sec. The fraction organic carbon (foc), based on adjusting the TOC by 0.58, ranges from 0.11 to 0.23%. The average foc is 0.17%. The average water content of the soil was 30.8%. The Width of Source Parallel to Groundwater Flow was left at 1,500 cm although the true width, as measured from GP10 to GP6, is 1,127.76 cm. Using these parameters, the BUSTR Tier 2 Cleanup Level for benzene is 1.7E+5 (170,000) mg/kg while the maximum concentration is 0.376 mg/kg. The Tier 2 Cleanup Level for benzene is many orders of magnitude higher than the highest concentration of benzene in soil at the Property. A No Further Action status should be granted for the Property.

5.4 OTHER TPH INFORMATION

The TPH soil actions levels are based on protection of groundwater. The action levels were initially derived by the Ohio Environmental Protection Agency (Ohio EPA) with help from private stakeholders. Members of the committee included Ed Phau of Ohio EPA[2], Bob Hare (GM), Dick Frankowski, Verne Ord (BUSTR), and Vanessa Steigerwald-Dick (Ohio EPA). Mr. Keith Egan of SME spoke with Mr. Phau about how the TPH action levels were derived. He stated they were not calculated but the values were extracted from Table 4 (p. 12) in the American Petroleum Institute (API) Bulletin 1629. API provided residual saturation concentrations for three petroleum ranges (gasoline, middle distillates and fuel oils) and five soil types (a matrix of 15 values). Mr. Phau explained that the Ohio EPA reduced this to three petroleum fractions in three soil types (a matrix of nine values), which required some interpolation, extrapolation, and rounding based on professional judgment.

The API document derived action levels are based on soil types ranging from a coarse gravel to fine sand. The action levels for heavy distillate oils ranged from 4,900 mg/kg (coarse gravel) to 39,000 mg/kg (fine sand). Ohio EPA took the 39,000 mg/kg residual saturation concentration for fine sand and extrapolated it to 40,000 mg/kg for silty clay. The contamination retention capabilities of silty clays are much higher than fine sand and as such, the standard is too low. When BUSTR adopted the Ohio EPA action levels, they decided silty clays, such as the soil at the Property were Class 2 soils while Ohio EPA considered them Class 3. Consequently, the action level for heavy distillate TPH in silty clay went from 40,000 mg/kg (Ohio EPA) to 20,000 mg/kg (BUSTR). Soil that would not be considered impacted by the Ohio EPA were considered impacted under BUSTR. The history of the derivation of the action levels shows that the maximum value at the Property, 21,300 mg/kg does not represent a saturation condition.

SME used Table 4 from the API document to estimate a realistic TPH saturation concentration for heavy distillates in silty clay. Using the average particle size for the soils listed in the Table 4, SME plotted particle size against the TPH saturation value (Appendix H-1). Using the best fit regression equation, the estimate TPH saturation concentration is 43,466 mg/kg[3]. SME also used an American Society of Testing and Materials (ASTM) method, to derive the per cent of saturation in the soil (Appendix H-2). The ASTM method estimated that the maximum concentration TPH at the Property only caused 10.5% of the pore space in soil to be saturated. ASTM considers that the pore space must contain 20 – 25% of TPH before it is considered mobile and could leach to groundwater. At the Property, if we use 19% pore space saturation as the TPH saturation concentration, that concentration would be 38,543 mg/kg.

Using different accepted methods, SME calculated the TPH saturation concentration for the silty clay soil at the Property ranges from 38,543 mg/kg to 43,466 mg/kg. These concentrations are not exceeded at the Property.

---

[2] Now with Hull and Associates.
[3] For non-detects, SME used the reporting level concentration which is the most conservative approach.

5.5 NO FURTHER ACTION REQUEST

The data and data evaluation support a No Further Action status for the former Hunt's Sohio Property. The following evidence supports this status:

- No groundwater impact is present although the USTs were last used over 20 years ago.
- Benzene in soil will not migrate to groundwater based on the following:
  - The representative concentration is 0.168 mg/kg which is less than the Closure Action Level for Class 2 Soils and Drinking Water.
  - Groundwater is not Drinking Water.
  - If groundwater was Drinking Water, the maximum concentration at the property is much less than the Tier 2 Cleanup Level.
- The representative concentration of TPH is much less than the action levels.
- The TPH result at T4-1 could not be duplicated by SME or Burgess & Niple and the representative concentration is much less than the action level.

6.0 BUSTR LIABILITY ANALYSIS

SME reviewed the historical data, reports, and other records and did not understand why the Village was continuing with the BUSTR corrective action when they are not the responsible party. A conference call with the Village was held to discuss their involvement. The Village was the sponsor of the original grant used to remove the USTs and perform the Tier 1 Assessment. However, this does not make the Village the responsible party. The Village did not own the Property or operate the USTs. The award of grant funding by USEPA and BUSTR requires that the agencies determine that the Village is not the responsible party. Copies of the letters from BUSTR stating this is provided in Appendix I. Other than to complete the work for BUSTR, the Village wanted the Property to be safe for redevelopment and believed a No Further Action status would mean the Property was safe for redevelopment.

Based on the foregoing, SME informed the Village that the Property appeared safe for redevelopment. The USTs have been removed and anyone buying the Property would not become the BUSTR defined "Owner" of the USTs and as such, would not be responsible for their removal and/or remediation of any soil or groundwater impact. In addition, the soil impact found during the UST closure and Tier 1 did not appear to present a risk to future commercial/industrial receptors at the Property for the following reasons:

- The impact did not exceed direct contact action levels.
- The impact did not exceed vapor intrusion action levels.
- The groundwater is not impacted.

The results of the investigations performed by the Ohio EPA, Burgess & Niple, and SME have not revealed any evidence to conclude the Property is not safe for redevelopment. The results also indicate a No Further Action status should be granted.

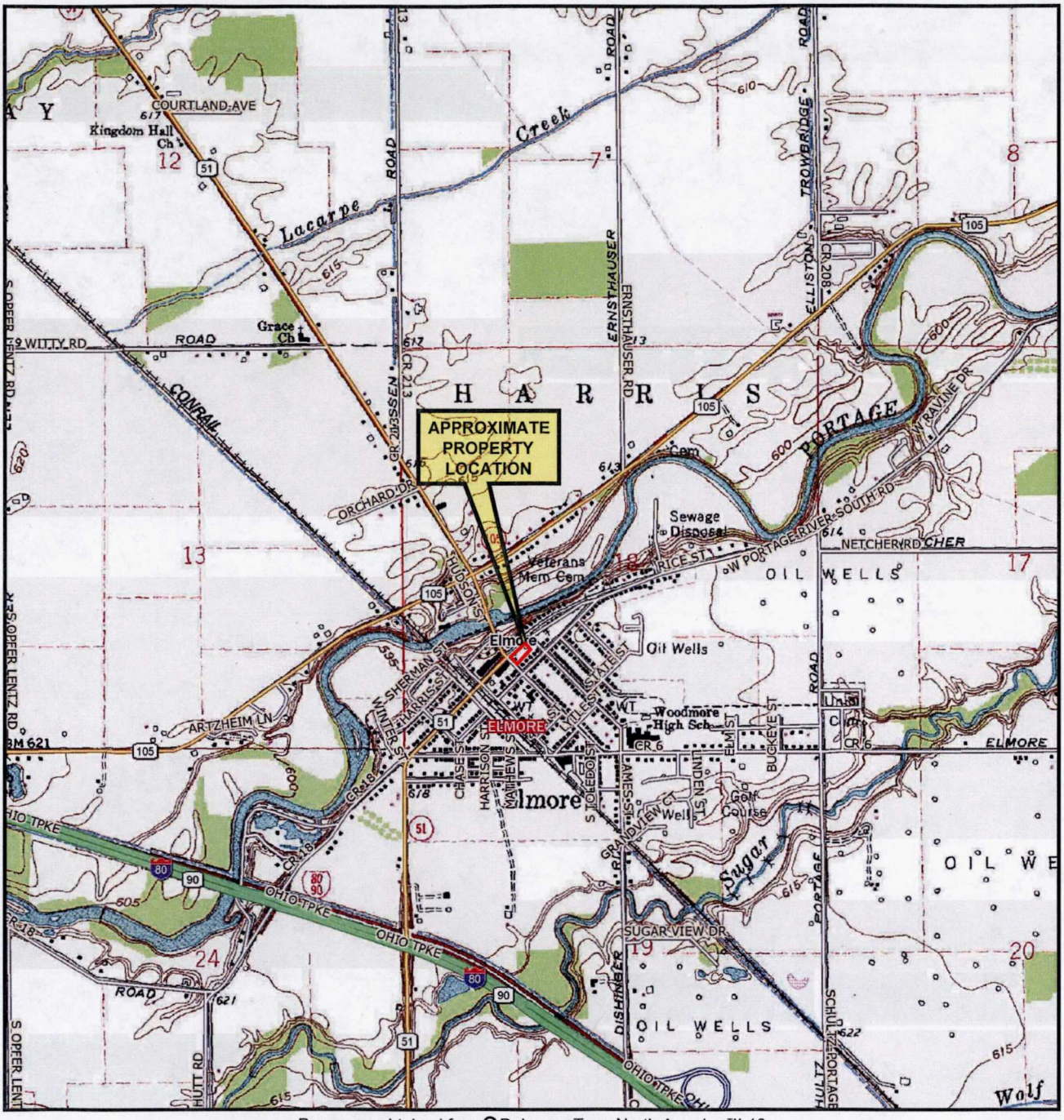
7.0 CONCLUSIONS AND RECOMMENDATIONS

The impacted soil at the Property does not exceed commercial and industrial action levels for direct contact with soil or vapor intrusion. The groundwater is not impacted. Section 5.0 demonstrated that the TPH and benzene that remaining in the soil will not migrate to groundwater. All of the work requested by BUSTR to obtain a No Further Action status has been completed and the results support a No Further Action status.

The Village is not the responsible party for the release at the Property and their role in meeting BUSTR requirements has been completed. The soil and groundwater data supports a conclusion the Property is safe for redevelopment.

Report prepared by: Keith Egan, CP #259
Report reviewed by: Ann M. Winegar, PG, CP #360

FIGURES



Base map obtained from © DeLorme Topo North America™ 10.

USGS QUADRANGLE(s) REFERENCED

ELMORE (OH) 1979

0' 2000'

SCALE: 1" = 2000'

NORTH

No.	Revision Date		
		Date	6-11-15
		Drawn By	JAB
		Designed By	KE
		Scale	1" = 2000'
		Project	066708.01.004.005

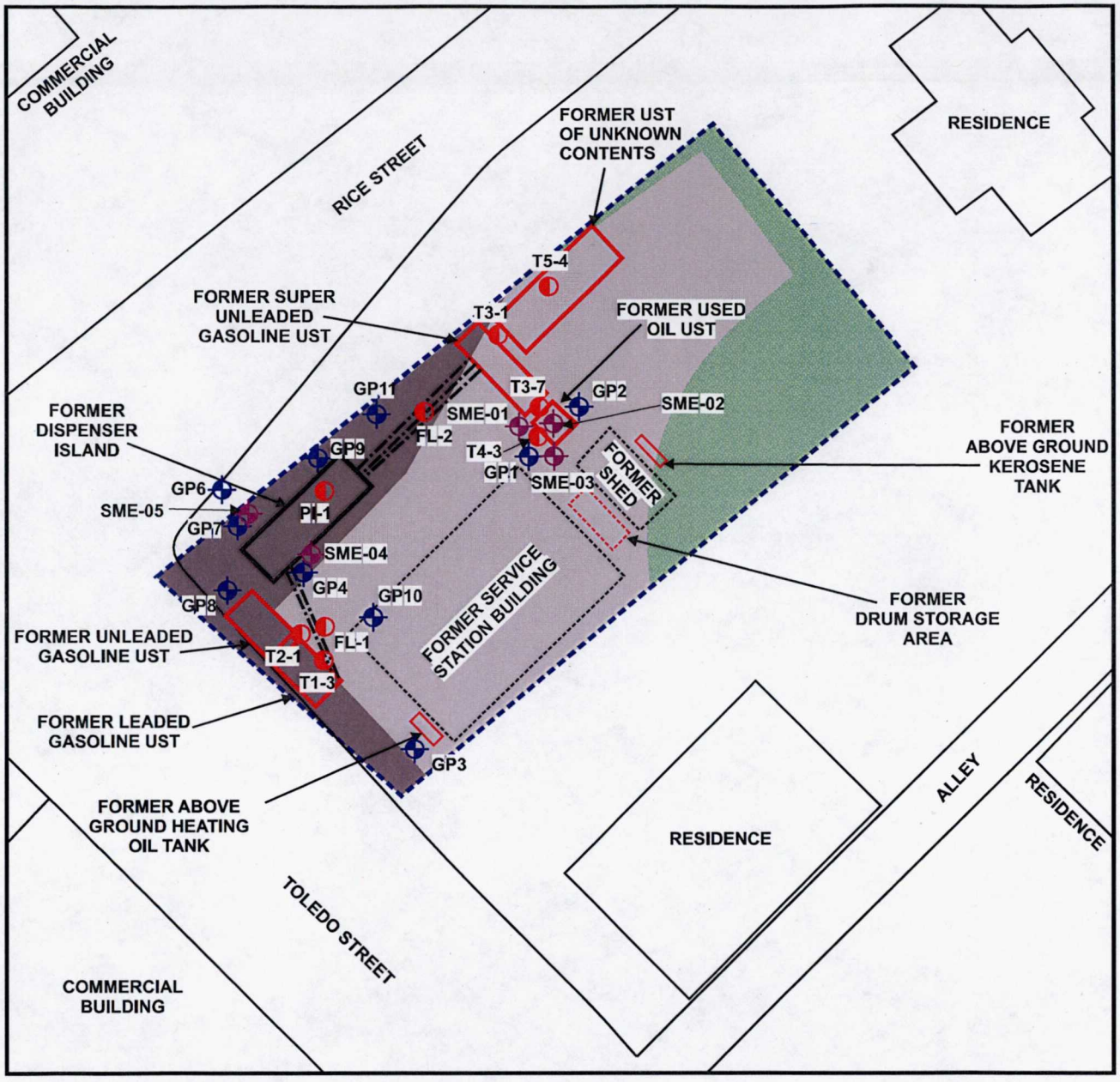
PROPERTY LOCATION MAP
FORMER HUNT'S SOHIO
408 RICE STREET
ELMORE, OHIO

SME
www.sme-usa.com

Figure No. 1

Jun 11, 2015 - 12:53pm - jblake

\\Smefile\work in progress\066708.01\CAD\066708.01.004.005\rev0\066708.01-01.dwg



LEGEND

- APPROXIMATE PROPERTY LOCATION
- HISTORIC TANK LOCATION
- FORMER FUEL LINES
- FORMER DRUM STORAGE AREA
- GRAVEL-COVERED SURFACE
- CONCRETE/ASPHALT-COVERED SURFACE
- GRASS-COVERED SURFACE
- BURGESS AND NIPLE SAMPLE LOCATION (2009)
- OHIO EPA SAMPLE LOCATION (2011)
- PROPOSED SAMPLE LOCATION

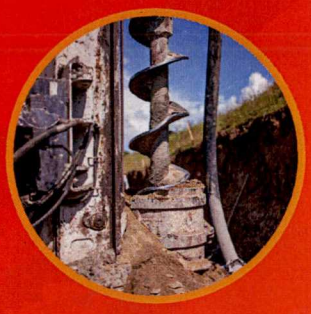
No.	Revision Date	Date	5-5-2015
		Drawn By	JWH
		Designed By	JWH
		Scale	1" = 30'
		Project	066708.01.004.004

SAMPLE LOCATION MAP
FORMER HUNT'S SOHIO
408 RICE STREET
VILLAGE OF ELMORE, OHIO

SME
www.sme-usa.com

Figure No. 2

APPENDIX A
SAMPLING AND ANALYSIS PLAN



SAMPLING AND ANALYSIS PLAN

FORMER HUNT'S SOHIO, 408 RICE STREET, ELMORE, OHIO

SME Project Number: 066708.01.004.005
Cooperative Agreement # BF-00E01066-0

SME

JUNE 12, 2015

TABLE OF CONTENTS

FIGURES

TABLES

1.0 INTRODUCTION

We prepared this Sampling and Analysis Plan (SAP) as a requirement of the United States Environmental Protection Agency (USEPA) brownfields grant program prior to using assessment grant funds for environmental investigation of the Property. The grantee, Ottawa County, intends to use its petroleum grant to fund an environmental assessment of the Former Hunt's Sohio Property located at 408 Rice Street in Elmore, Ohio. This property is hereinafter referred to as "the Property". The Property was determined to be eligible for the use of petroleum funds on May 20, 2015. The general location of the Property is shown on Figure 1.

The objective of this assessment is to obtain information required by the Bureau of Underground Storage Tank regulations to complete a Tier III risk analysis. Descriptions of the site history and known current environmental conditions; strategies and procedures for collection and chemical analyses of soil and groundwater samples, data evaluation, and reporting; and the estimated project schedule are presented in the following sections.

2.0 PROPERTY HISTORY, CURRENT CONDITIONS, AND PLANNED PROPERTY ASSESSMENT

Summaries of the Property history, current Property conditions, and recognized environmental conditions (RECs) identified during previous investigations of the Property are presented in the following subsections. The Assessment Team's planned subsurface assessment activities to further evaluate the Property are also summarized.

2.1 PROPERTY HISTORY

According to Sanborn Fire Insurance Maps, the Property was commercially developed by 1880. In 1920, Standard Oil of Ohio purchased the Property and installed several underground storage tanks (USTs) and operated the Property as a filling station. Mr. James Hunt purchased the Property in 1982 and in 1994, quit selling fuel and operating the USTs. He continued to perform automobile maintenance on the Property into the early 2000s. Mr. Hunt died in 2007 and the Property is currently owned by Mr. Hunt's estate.

During 2004, the Village of Elmore informed BUSTR that there were several petroleum underground storage tanks (USTs) which had not been used in several years at the Property. Following Mr. Hunt's death, the Village of Elmore obtained Ohio Environmental Protection Agency (Ohio EPA) funds and performed a Targeted Brownfield Assessment, which found evidence of soil and groundwater contamination at the site.

Using a USEPA Site-Specific Brownfield Assessment Grant, five underground storage tanks (USTs) were removed in 2009 by Burgess & Niple on behalf of the Estate of Mr. Hunt, and a Closure Assessment Report was submitted to BUSTR. The Closure Report indicated that approximately 640 cubic yards of petroleum contaminated soil were excavated and disposed at the Petro Environmental landfill in Lodi, Ohio. Eleven soil samples were collected from the excavation floor and sidewalls, and laboratory analyses indicated that one of the 11 samples contained heavy distillate petroleum compounds (total petroleum hydrocarbons or TPH) above the allowable risk-based Action Levels for this site. Based on these results, a Tier 1 Source Investigation was required per Ohio Administrative Code 1301:7-9-13.

A Tier 1 Source Investigation was performed during 2011 by Burgess & Niple. The Tier 1 Investigation included installation of 11 soil borings, three of which were then converted into groundwater monitoring wells. Limited soil impact and no groundwater impact were identified.

In a December 2014 memorandum, BUSTR listed the following activities that needed to be performed to Achieve "No Further Action" status for the Property

1. Additional soil samples must be collected and analyzed for geotechnical parameters to calculate a site-specific target level for benzene (for the soil leaching to drinking water exposure pathway).

2. Additional soil samples must be collected and analyzed for TPH-ORO to calculate a 95% UCL for heavy distillate TPH. BUSTR guidance documents recommend collecting and analyzing a minimum of twelve soil samples from the source area(s) for this statistical calculation.

2.2 CURRENT CONDITIONS

The Property was most recently occupied by an automobile repair company, but is currently vacant. Several environmental investigations have been conducted at the Property. The Property features, including the locations of the former USTs and sample locations, are shown on Figure 2.

2.3 ENVIRONMENTAL CONDITIONS

The Tier 1 Investigation identified the following issues related to the potential risks to human health and the environment at this site:

1. Two post-excavation soil samples contained petroleum chemicals of above the risk-based Action Levels for this site. The chemical which exceeded Tier 1 Action Levels was benzene (a human carcinogen) at a concentration exceeding the default soil leaching to groundwater action level. Benzene was not present at a concentration presenting a health risk via direct contact with soils.

2. The Former Hunt's Sohio site is on the edge of the Village of Elmore's Drinking Water Source Protection Area (DWSPA). Groundwater is considered a drinking water resource and is currently being used for drinking purposes in the Village.

3. Groundwater samples collected from the site and adjacent properties generally contain low or non-detectable concentrations of petroleum chemicals.

2.4 PLANNED SITE ASSESSMENT

We designed the proposed assessment activities to obtain the data requested by BUSTR. The geotechnical data can serve two purposes. The BUSTR action levels are based on soil type. Previous consultants used the Class 2 soil type because they determined the impacted soil was a silty clay based on analysis of soil type from intervals that were not impacted. A review of the boring logs indicates the impacted zone and the zone where soil leaching would occur may be Class 3. If so, none of the action levels are exceeded. We will compare the sample results to applicable BUSTR action levels based on the true soil type.

3.0 SAMPLING PLAN

The sampling plan for the assessment activities is presented in this section. The sampling plan includes a summary of the planned soil, soil gas, and groundwater sampling locations, rationales for those locations, and descriptions of procedures and methods for field sampling.

3.1 SUMMARY OF SAMPLING LOCATIONS

SME's project team will use data collected during field activities and from analyses of soil and groundwater samples to evaluate current environmental conditions at the Property. Specific sampling objectives, rationales for the sample locations and depths, and target analytes are summarized in Table 1.

The planned sampling locations (SME-01 through SME-05) are shown on Figure 2. We selected the sample locations to evaluate the former samples that were impacted. SME's assessment team will advance a soil boring at each boring location using hydraulically driven, direct-push coring equipment for collection of soil samples. We will collect soil samples for visual classification, field screening, and/or laboratory analyses using a two-inch outside-diameter, four-foot long sampler fitted with new, single-use, plastic liners. The rationales for the selection of sample intervals at each boring are further discussed in Section 3.2.1.

3.2 SAMPLING PROCEDURES AND METHODS

Soil and groundwater sampling, quality control (QC) sampling, and waste management procedures and methods are summarized in this subsection. Sampling activities will be conducted in accordance with the Quality Assurance Project Plan (QAPP) for Ottawa County.

3.2.1 SOIL, SOIL GAS, AND GROUNDWATER SAMPLING

SME's field representative will collect soil and groundwater samples during sampling activities according to the methods described in SOP 1, Soil and Groundwater Sampling Using Direct-Push Methods, included in the QAPP. Up to six soil samples will be submitted for laboratory analysis of TPH. Up to 10 samples will be submitted for geotechnical analysis.

For borings SME-01 through SME-03, the sample interval from above the soil/water interface that exhibits the highest measurement on the photoionization detector (PID) will be submitted for laboratory analysis. Additionally, a sample from each of the borings at the 8-9 foot interval will be collected for laboratory analysis. This is the interval where TPH was measured at a concentration above the action level. If the 8-9 foot interval exhibits the highest measurement on the PID, then the interval with the next highest PID measurement will be submitted for laboratory analysis. For the geotechnical samples the following intervals will be collected for analysis:

- SME-01 – SME-03 8-10 and 10-12 feet bgs.
- SME-04 and SME-05 6-8 and 8-0 feet bgs.

These intervals correspond to the depth of impact and the interval below the impact. Details of our proposed drilling and sampling activities are shown on Table 1.

3.2.2 QUALITY ASSURANCE AND QUALITY CONTROL

We will minimize the potential for cross-contamination by using new, disposable, nitrile sampling gloves for collection of each soil and groundwater sample; using new polyethylene and/or silicone sample tubing for collection of each groundwater sample; decontaminating soil sampling equipment before each use; and, calibrating field instruments in accordance with manufacturer's instructions.

SME's field representative will collect quality control (QC) samples as described in SOP 6, Field Quality Control Samples, included in the project QAPP and as summarized in Table 1. The sample handling and custody requirements, laboratory analytical methods, analysis reporting limits, and reporting protocols will be consistent with those outlined in the project QAPP.

3.2.3 WASTE MANAGEMENT

We will manage investigation derived wastes as described in SOP 12, Investigative Derived Wastes, included in the project QAPP.

4.0 ANALYSIS PLAN

The designated laboratory will analyze soil, soil gas, and groundwater samples for indicator parameters to screen for the potential presence of impact associated with the RECs identified (see Table 1 for specific analytes for each sample).

Laboratory analyses and field screening will be performed as described in the project QAPP. EA Group, Inc. (EA Group) of Mentor, Ohio will analyze the soil and groundwater samples for TPH and fraction organic carbon. SME will analyze the soil using sieve analysis and atterberg limits in our geotechnical soils laboratory in Kirtland, Ohio. The following US EPA and ASTM methods will be used:

- TPH – Method 8015 (soils only).
- Soil Type – ASTM Methods C136 and D4318.
- Fraction Organic Carbon – Walkley Black.

We propose to analyze the soil samples for TPH and geotechnical parameters. These analytes were selected because they were requested by BUSTR.

Laboratory testing for TPH (non-geotechnical), the analysis method reporting limits (MRLs), QA/QC procedures, and reporting protocols used or performed by EA Group will be consistent with those described in the project QAPP.

5.0 DATA EVALUATION AND REPORTING

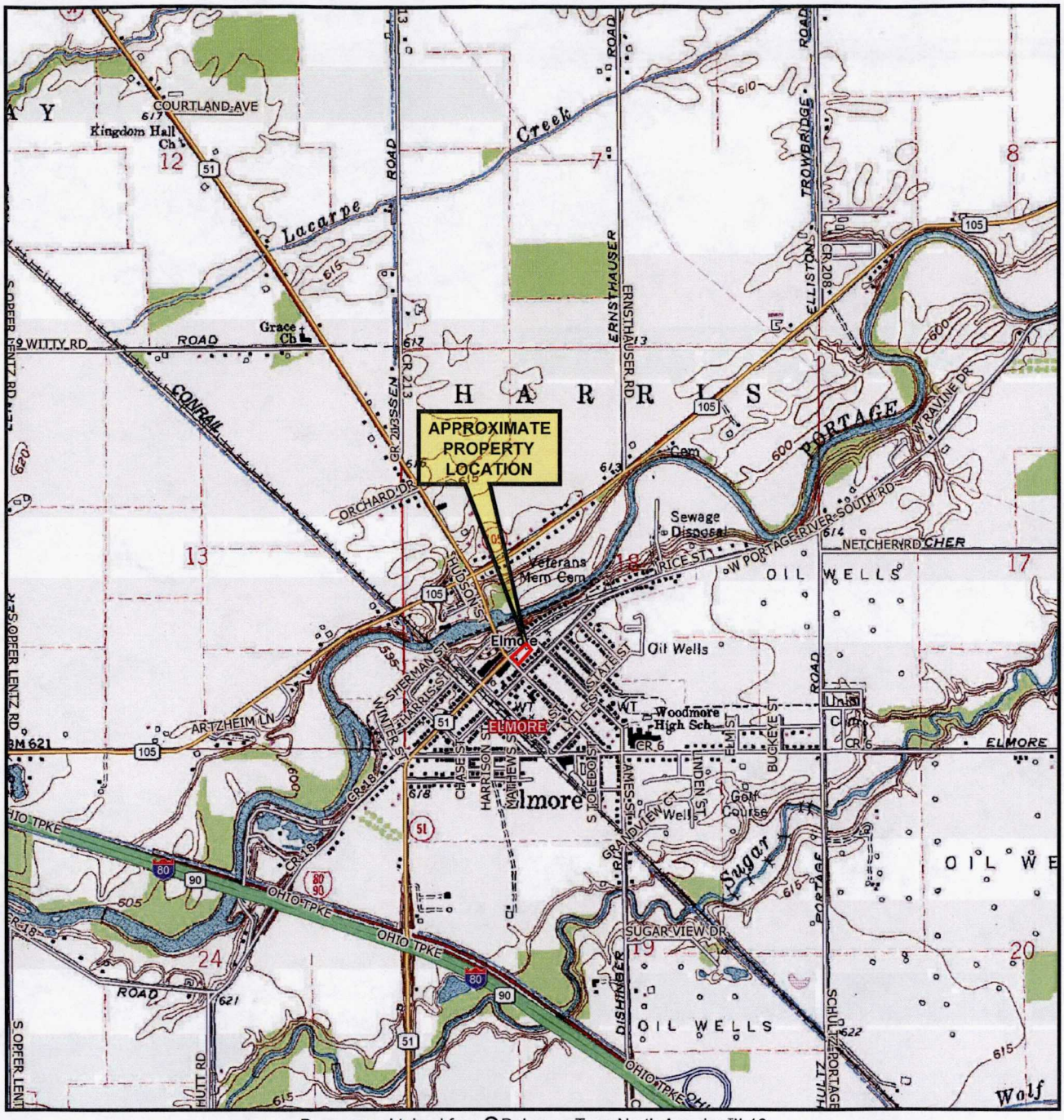
We will evaluate the data collected during this site assessment as described in Section 4.0 - Data Verification/Validation and Usability of the project QAPP. Following data review, verification, and validation, we will prepare a Phase II ESA report. The Tier III report will include details of the activities performed, procedures followed, and results. The report also will include a sampling location diagram, tabulated analytical results, soil boring logs, a copy of the laboratory analytical report for all samples collected, and a copy of the chain-of-custody (COC) records. Depending on the chemicals-of-concern detected and the concentrations measured, the report may include a risk assessment to evaluate cumulative risk of exposure by the applicable pathways.

6.0 ESTIMATED SCHEDULE

The environmental activities described in this SAP are to be implemented according to the schedule presented below. This schedule is in weeks relative to EPA approval of the SAP.

- Field Sampling ..... Week 1 - 2
- Laboratory Analyses ..... Week 2 through Week 4
- Data Evaluation and Reporting ..... Week 5 through 7

FIGURES



Base map obtained from © DeLorme Topo North America™ 10.

USGS QUADRANGLE(s) REFERENCED

ELMORE (OH) 1979

0' 2000'

SCALE: 1" = 2000'

NORTH

No.	Revision Date		
		Date	6-11-15
		Drawn By	JAB
		Designed By	KE
		Scale	1" = 2000'
		Project	066708.01.004.005

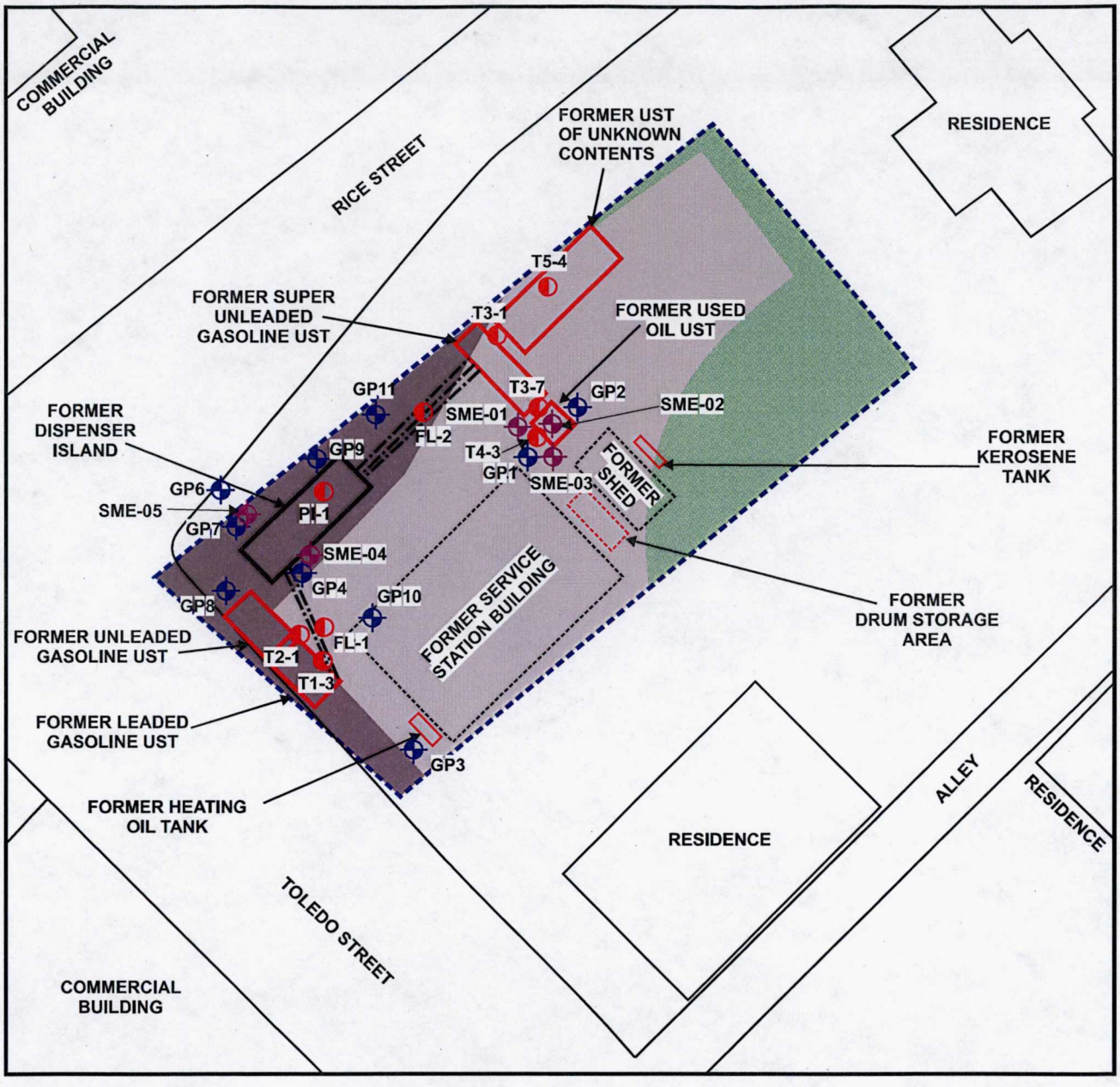
PROPERTY LOCATION MAP
FORMER HUNT'S SOHIO
408 RICE STREET
ELMORE, OHIO

SME
www.sme-usa.com

Figure No. 1

Jun 11, 2015 - 12:53pm - jblake

\\Smefile\work in progress\066708.01\CAD\066708.01.004.005\rev0\066708.01-01.dwg



LEGEND

- APPROXIMATE PROPERTY LOCATION
- HISTORIC TANK LOCATION
- FORMER FUEL LINES
- FORMER DRUM STORAGE AREA
- GRAVEL-COVERED SURFACE
- CONCRETE/ASPHALT-COVERED SURFACE
- GRASS-COVERED SURFACE
- BURGESS AND NIPLE SAMPLE LOCATION (2009)
- OHIO EPA SAMPLE LOCATION (2011)
- PROPOSED SAMPLE LOCATION

No.	Revision Date		
		Date	5-5-2015
		Drawn By	JWH
		Designed By	JWH
		Scale	1" = 30'
		Project	066708.01.004.004

PROPOSED AND HISTORICAL SAMPLE LOCATION MAP
FORMER HUNT'S SOHIO
408 RICE STREET
VILLAGE OF ELMORE, OHIO

SME
www.sme-usa.com

Figure No. 2

TABLES

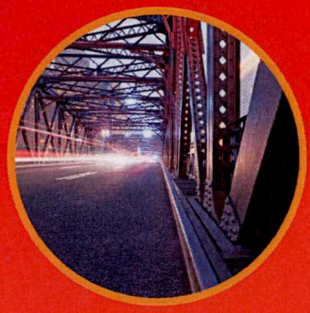
TABLE 1: PROPOSED SAMPLE COLLECTION AND ANALYSIS

TABLE 1
PROPOSED SAMPLE COLLECTION AND ANALYSES
FORMER HUNT'S SOHIO
ELMORE, OHIO
SME PROJECT NO: 066708.01.004.005

SAMPLE TYPE AND LOCATION	SAMPLING TARGET	TARGET SAMPLE DEPTH (feet bgs)	ANALYTES			COMMENTS
			TPH (C20 - C34)	Grain Size[1]	TOC	
SME-01 - SME-03	Closure sample T-4 that had only TPH concentration exceeding action level based on soil type.	TPH: 8-10'	6	6	3	BUSTR will allow use of 95% UCL for TPH but insufficient detections to run test. TPH concentration barely exceeds action level based on a lean clay. Boring logs indicate soil may be fat clay and if so, action levels are not exceeded.
		Soil Parameters: 8-10' and 10-12'				
SME-04 and SME-05	Tier I samples GP4 and GP-6 had only benzene concentrations exceeding action level based on soil type.	Soil Parameters: 8-10' and 10-12'	0	4	2	Boring logs indicate soil may be a fat clay and if so, action levels are not exceeded.
SUBTOTALS		Soil	6	10	5	
QA/QC SAMPLES	Trip Blank	Groundwater	0	0	0	
	Duplicate	Soil	1	0	1	
QA/QC SUBTOTALS		Soil	1	0	1	

Notes:

1 - Sieve Analysis by ASTM C136 and Atterburg Limits by D4318.



Passionate People Building
and Revitalizing our World

SME

APPENDIX B
SOIL BORING LOGS

BORING S1

PROJECT NAME: Hunt's Sohio
PROJECT NUMBER: 066708.01.004.005
CLIENT: Ottawa County
PROJECT LOCATION: Elmore, Ohio
DATE STARTED: 7/27/15 **COMPLETED:** 7/27/15
BORING METHOD: Direct Push
OPERATOR: JH **RIG NO.:** Geoprobe
LOGGED BY: MTP **CHECKED BY:** AMW

DEPTH (FEET)	SURFACE ELEVATION: Not Surveyed PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY (inches)	PID (ppm)	SOIL ANALYTICAL SAMPLE	REMARKS
0	0.3 FILL- GRAVEL- Light Brown (GP)					
	SAND with Gravel- Gray to Light Brown (SP)			<1		
	2.0	LS1	48			
	Silty CLAY- Brown to Reddish Brown (CL/ML)			<1		
	4.0 Sandy LEAN CLAY- Brown to Reddish Brown (CL)					
5	5.0			<1		
		LS2	48			
	Silty CLAY- Brown (CL/ML)			<1		
				<1		
10	10.0	LS3	40			
				<1		
	LEAN CLAY- Gray to Brown (CL)			<1		
		LS4	24			
15				<1		
	16.0					

END OF BORING AT 16.0 FEET.

GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Soil Cuttings

NOTES:
1. Soil samples were classified according to ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) for environmental purposes only. Therefore, the boring logs and associated report(s) should not be used for geotechnical evaluation or design.
2. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
3. No odors were noted and no staining was observed.

BORING S2

PROJECT NAME: Hunt's Sohio
PROJECT NUMBER: 066708.01.004.005
CLIENT: Ottawa County
PROJECT LOCATION: Elmore, Ohio
DATE STARTED: 7/27/15 **COMPLETED:** 7/27/15
BORING METHOD: Direct Push
OPERATOR: JH **RIG NO.:** Geoprobe
LOGGED BY: MTP **CHECKED BY:** AMW

DEPTH (FEET)	SURFACE ELEVATION: Not Surveyed PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY (inches)	PID (ppm)	SOIL ANALYTICAL SAMPLE	REMARKS
0	0.3 FILL- Gravel- Light Brown to Gray (GP)					
				<1		
		LS1	24			
	FILL- SAND with Gravel- Light Brown (SP)			<1		
5	5.0			<1		
	FILL- GRAVEL wih Sand- Gray to Light Brown (GP)					
	6.0	LS2	20			
	Silty SAND- Dark Brown- Wet (SM)			<1		
	8.0					
	GRAVEL with Sand- Dark Brown to Gray (GP)					
	9.0			<1		
	Sandy SILT- Dark Brown (SM/ML)					
10	10.0	LS3	48			
				<1		
	LEAN CLAY- Brown (CL)			<1		
		LS4	24			
15				<1		
	16.0					
	END OF BORING AT 16.0 FEET.					

GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Soil Cuttings

NOTES:
1. Soil samples were classified according to ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) for environmental purposes only. Therefore, the boring logs and associated report(s) should not be used for geotechnical evaluation or design.
2. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
3. No odors were noted and no staining was observed.

BORING S3

PROJECT NAME: Hunt's Sohio
PROJECT NUMBER: 066708.01.004.005
CLIENT: Ottawa County
PROJECT LOCATION: Elmore, Ohio
DATE STARTED: 7/27/15 **COMPLETED:** 7/27/15 **BORING METHOD:** Direct Push
OPERATOR: JH **RIG NO.:** Geoprobe **LOGGED BY:** MTP **CHECKED BY:** AMW

DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: Not Surveyed PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY (inches)	PID (ppm)	SOIL ANALYTICAL SAMPLE	REMARKS
0		0.3 FILL- Gravel- Light Brown (GP)					
		FILL- SAND with Gravel- Gray to Brown (SP)	LS1	40	<1		
		2.0 LEAN CLAY (CL)					
		2.5 SILT with Sand- Brown to Reddish Brown (ML)			<1		
		3.5					
5		Silty CLAY- Brown (CL/ML)	LS2	48	<1		
					<1		
			LS3	24	<1		
10		10.0 LEAN CLAY- Brown to Gray (CL)			<1		
		12.0					
		Shelby Tube	2ST1				
15		16.0					

END OF BORING AT 16.0 FEET.

GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Soil Cuttings

NOTES:
1. Soil samples were classified according to ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) for environmental purposes only. Therefore, the boring logs and associated report(s) should not be used for geotechnical evaluation or design.
2. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
3. No odors were noted and no staining was observed.

BORING S4

PROJECT NAME: Hunt's Sohio
PROJECT NUMBER: 066708.01.004.005
CLIENT: Ottawa County
PROJECT LOCATION: Elmore, Ohio
DATE STARTED: 7/27/15 **COMPLETED:** 7/27/15
BORING METHOD: Direct Push
OPERATOR: JH **RIG NO.:** Geoprobe
LOGGED BY: MTP **CHECKED BY:** AMW

DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: Not Surveyed PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY (inches)	PID (ppm)	SOIL ANALYTICAL SAMPLE	REMARKS
0		0.3 FILL- Gravel (GP)					
		FILL- SAND with Gravel- Dark Gray to Dark Brown (SP)	LS1	36	<1		
		2.5					
		Sandy SILT- Brown to Reddish Brown (ML)			<1		
5		5.0			<1		
		Silty CLAY- Brown to Gray (CL/ML)	LS2	48	<1		
			LS3	24	<1		
10		10.0					
		Shelby Tube	2ST1		<1		
		12.0			<1		
		LEAN CLAY with Sand- Gray (CL)	LS4	12			
15		16.0			<1		

END OF BORING AT 16.0 FEET.

GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Soil Cuttings

NOTES:
1. Soil samples were classified according to ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) for environmental purposes only. Therefore, the boring logs and associated report(s) should not be used for geotechnical evaluation or design.
2. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
3. No odors were noted and no staining was observed.

BORING S5

PROJECT NAME: Hunt's Sohio
PROJECT NUMBER: 066708.01.004.005
CLIENT: Ottawa County
PROJECT LOCATION: Elmore, Ohio
DATE STARTED: 7/27/15 **COMPLETED:** 7/27/15
BORING METHOD: Direct Push
OPERATOR: JH **RIG NO.:** Geoprobe
LOGGED BY: MTP **CHECKED BY:** AMW

DEPTH (FEET)	SYMBOLIC PROFILE	SURFACE ELEVATION: Not Surveyed PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY (inches)	PID (ppm)	SOIL ANALYTICAL SAMPLE	REMARKS
0		0.3 CONCRETE					
			LS1	12	<1		
					<1		
		Clayey SILT- Brown to Gray (ML/CL)					
5			LS2	36	<1		
		8.0			<1		
			LS3	36	<1		
10		LEAN CLAY- Brown to Gray (CL)					
					<1		
		14.0	LS4	12			
15		SAND with Clay- Very Dark Brown to Dark Gray (SP-SC)			<1		
		16.0					

END OF BORING AT 16.0 FEET.

GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Soil Cuttings

NOTES:
1. Soil samples were classified according to ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) for environmental purposes only. Therefore, the boring logs and associated report(s) should not be used for geotechnical evaluation or design.
2. The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
3. No odors were noted and no staining was observed.

APPENDIX C
LABORATORY DATA REPORTS

EA GROUP

Environmental Analysis
and Management

SME
9375 Chillicothe Rd.
Kirtland, OH 44094
Maria Proto

Client Project Hunt's Sunoco
EA Group Workorder Number: 150700396
Received on July 28, 2015

The following analytical report contains results as requested for samples submitted to EA Group. The results included in this report have been reviewed for compliance with the analytical methods indicated in this report. All data has been found to be compliant with accepted laboratory protocol, except as noted in the QC narrative. Industrial hygiene reports, air and/or surface concentrations results are based upon sampling information provided by the client. Industrial hygiene results will not be blank corrected. Analyst initials of REF indicate analysis performed at a subcontract facility.

If you have questions, comments or require further assistance regarding this report, please contact your client services representative or one of the individuals listed below.

Data or reporting:
Debbie Lauer - Lab Manager
dlauer@eagroupohio.com

Mike Herbert - General Manager
mherbert@eagroupohio.com

Sample tracking, supplies:
Haley Imler - Sample Control
sreceiving@eagroupohio.com

Invoice Related:
Bonnie Renbarger - Office Manager
brenbarger@eagroupohio.com

7118 Industrial Park Blvd. , Mentor, Ohio 44060-5314
(440) 951-3514 (800) 875-3514 FAX (440) 951-3774 www.eagroupohio.com

EA GROUP
Environmental Analysis
and Management

Laboratory Analytical Report

SME

9375 Chillicothe Rd.

Kirtland, OH 44094

Attention:
Maria Proto

Client Project:

Hunt's Sunoco

Purchase Order:
066708-01-004-005

EA Group Workorder:
1507-00396

Jeffrey A. Herbert

Deputy Laboratory Manager

August 4, 2015

7118 Industrial Park Blvd., Mentor, Ohio 44060-5314
(440) 951-3514 (800) 875-3514 FAX (440) 951-3774 www.eagroupohio.com

EA GROUP
Environmental Analysis and Management

Sample Receive Date 7/28/2015

Sample Listing

EAG Sample Identification	Client Sample Identification	EAG Sample Identification	Client Sample Identification
150700396 - 001	SME 1 3-5	150700396 - 002	SME 1 8-9
150700396 - 003	SME 1 10-12	150700396 - 004	SME 2 8-9
150700396 - 005	SME 2 10-12	150700396 - 006	SME 3 2-4
150700396 - 007	SME 3 8-9	150700396 - 008	SME 3 10-12
150700396 - 009	SME 4 8-9	150700396 - 010	SME 5 8-9
150700396 - 011	Dup 1		

EA GROUP

Environmental Analysis
and Management

Project Narrative
1507-00396

All analyses performed by EA Group were done using established laboratory SOPs. Management has reviewed the data for compliance with the laboratory QA/QC plan and data have been found to be compliant with the laboratory protocols unless otherwise noted below. All results listed for this report relate only to the samples submitted on this work order.

The temperature of the sample(s) upon receipt was 5.8°C. Samples were transported on wet ice.

Misc. QC Comments

Percent Moisture is used to report results on a dry weight basis.

When necessary, reporting limits of individual samples may be raised due to high concentration of interfering compounds or target analytes, or quantity of sample available for analysis.

pH method note: If this analysis was performed in the laboratory, it may not meet the "immediate analysis" requirement that applies to most wastewater monitoring samples. In such cases, analysis for pH should be done at the time of sampling.

The results listed in this report relate only to the samples submitted to EA Group per the chain of custody.

Data Flag Table

B	The method blank contained a standard laboratory contaminant (Methylene Chloride, Acetone, Hexane, Phthalates, etc.) above the standard laboratory method detection limit. If the analyte is present in the sample at a concentration up to ten times the blank level, the result is reported with a "B" indicating method blank contamination. Samples will be reported without a "B" if the analyte concentration in the sample is greater than ten times the blank level.
E	An analytical result marked with an "E" indicates the result reported is above the high end limit of the calibration curve and should be considered an estimated concentration.
DIL	Due to matrix interference or high analyte concentration, a dilution was required. The spikes and/or surrogates results could not be quantitated and therefore marked "DIL".
J	An analytical result marked with a "J" indicates the result reported was below the standard reporting limit and above the method detection limit. As the observed level approaches the MDL there is an increasing probability of a false positive response.
MI	Analytical results marked as "MI" indicate that due to inherent matrix interference, the result could not be quantitated.
#	Results flagged "#" indicate the reported result may be outside allowable permit levels as provided by the client, when applicable.
NA	A result or field marked as "NA" indicates that it was not applicable for this project.
Q	A quality control result flagged with a "Q" indicates the percent recovery was outside the acceptable range as determined by the laboratory.

** Positive results for this analyte represent a probable combination of 3-Methylphenol (m-Cresol) and 4-Methylphenol (p-Cresol).

EA GROUP
Environmental Analysis and Management

EAG Workorder: 1507-00396
Client Project: Hunt's Sunoco

Client ID: SME 1 3-5 **Date/Time Sampled:** 7/27/2015 / 1300 **Received:** 7/28/2015
EAG ID: 1507-00396-1

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		19	0.10	%	7/30/2015	7/30/2015		MH
TOC: Walkley Black		**0.39**	0.050	%	8/04/2015	8/04/2015		SLD

Client ID: SME 1 8-9 **Date/Time Sampled:** 7/27/2015 / 1300 **Received:** 7/28/2015
EAG ID: 1507-00396-2

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		20	0.10	%	7/30/2015	7/30/2015		MH

Client ID: SME 1 10-12 **Date/Time Sampled:** 7/27/2015 / 1300 **Received:** 7/28/2015
EAG ID: 1507-00396-3

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		20	0.10	%	7/30/2015	7/30/2015		MH

Client ID: SME 2 8-9 **Date/Time Sampled:** 7/27/2015 / 1230 **Received:** 7/28/2015
EAG ID: 1507-00396-4

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		20	0.10	%	7/30/2015	7/30/2015		MH

Client ID: SME 2 10-12 **Date/Time Sampled:** 7/27/2015 / 1230 **Received:** 7/28/2015
EAG ID: 1507-00396-5

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		17	0.10	%	7/30/2015	7/30/2015		MH

Client ID: SME 3 2-4 **Date/Time Sampled:** 7/27/2015 / 1410 **Received:** 7/28/2015
EAG ID: 1507-00396-6

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		15	0.10	%	7/30/2015	7/30/2015		MH
TOC: Walkley Black		**0.40**	0.050	%	8/04/2015	8/04/2015		SLD

Client ID: SME 3 8-9 **Date/Time Sampled:** 7/27/2015 / 1410 **Received:** 7/28/2015
EAG ID: 1507-00396-7

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		20	0.10	%	7/30/2015	7/30/2015		MH

EA GROUP
Environmental Analysis and Management

EAG Workorder: 1507-00396
Client Project: Hunt's Sunoco

Client ID: SME 3 10-12 **Date/Time Sampled:** 7/27/2015 / 1410 **Received:** 7/28/2015
EAG ID: 1507-00396-8

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		20	0.10	%	7/30/2015	7/30/2015		MH

Client ID: SME 4 8-9 **Date/Time Sampled:** 7/27/2015 / 1430 **Received:** 7/28/2015
EAG ID: 1507-00396-9

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		20	0.10	%	7/30/2015	7/30/2015		MH
TOC: Walkley Black		**0.19**	0.050	%	8/04/2015	8/04/2015		SLD

Client ID: SME 5 8-9 **Date/Time Sampled:** 7/27/2015 / 1500 **Received:** 7/28/2015
EAG ID: 1507-00396-10

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		20	0.10	%	7/30/2015	7/30/2015		MH
TOC: Walkley Black		**0.16**	0.050	%	8/04/2015	8/04/2015		SLD

Client ID: Dup 1 **Date/Time Sampled:** 7/27/2015 **Received:** 7/28/2015
EAG ID: 1507-00396-11

Parameter	CAS #	Result	Reporting Limit	Units	Prep Date	Analysis Date	Time	Analyst
Percent Moisture		20	0.10	%	7/30/2015	7/30/2015		MH

EA GROUP
Environmental Analysis and Management

EAG Workorder 1507-00396
EAG ID: 1507-00396-002
Client ID: SME 1 8-9
Client Project: Hunt's Sunoco

Matrix: Solid
Analyst: JAH

Date Sampled: 07/27/2015
Time Sampled: 1300
Date Received: 07/28/2015

Parameter	CAS #	Result	Reporting Limit	Units	Date Analyzed
Total Petroleum Hydrocarbons: SW846-8015M					
Extractable Petroleum Hydrocarbons: C10-C20		<130	130	mg/kg	8/02/2015
Extractable Petroleum Hydrocarbons: C20-C34		<130	130	mg/kg	8/02/2015
Extraction: SW846-3550A		Complete			7/31/2015

Surrogate	Percent Recovery	Recovery Limits
n-Triacontane	85.7	(37 - 137)

EA GROUP
Environmental Analysis and Management

EAG Workorder 1507-00396
EAG ID: 1507-00396-003
Client ID: SME 1 10-12
Client Project: Hunt's Sunoco

Matrix: Solid
Analyst: JAH

Date Sampled: 07/27/2015
Time Sampled: 1300
Date Received: 07/28/2015

Parameter	CAS #	Result	Reporting Limit	Units	Date Analyzed
Total Petroleum Hydrocarbons: SW846-8015M					
Extractable Petroleum Hydrocarbons: C10-C20		<130	130	mg/kg	8/02/2015
Extractable Petroleum Hydrocarbons: C20-C34		<130	130	mg/kg	8/02/2015
Extraction: SW846-3550A		Complete			7/31/2015

Surrogate	Percent Recovery	Recovery Limits
n-Triacontane	84.2	(37 - 137)

EA GROUP
Environmental Analysis and Management

EAG Workorder 1507-00396
EAG ID: 1507-00396-004
Client ID: SME 2 8-9
Client Project: Hunt's Sunoco

Matrix: Solid
Analyst: JAH

Date Sampled: 07/27/2015
Time Sampled: 1230
Date Received: 07/28/2015

Parameter	CAS #	Result	Reporting Limit	Units	Date Analyzed
Total Petroleum Hydrocarbons: SW846-8015M					
Extractable Petroleum Hydrocarbons: C10-C20		<130	130	mg/kg	8/02/2015
Extractable Petroleum Hydrocarbons: C20-C34		<130	130	mg/kg	8/02/2015
Extraction: SW846-3550A		Complete			7/31/2015

Surrogate	Percent Recovery	Recovery Limits
n-Triacontane	85.2	(37 - 137)

EA GROUP
Environmental Analysis and Management

EAG Workorder 1507-00396
EAG ID: 1507-00396-005
Client ID: SME 2 10-12
Client Project: Hunt's Sunoco

Matrix: Solid
Analyst: JAH

Date Sampled: 07/27/2015
Time Sampled: 1230
Date Received: 07/28/2015

Parameter	CAS #	Result	Reporting Limit	Units	Date Analyzed
Total Petroleum Hydrocarbons: SW846-8015M					
Extractable Petroleum Hydrocarbons: C10-C20		<120	120	mg/kg	8/02/2015
Extractable Petroleum Hydrocarbons: C20-C34		<120	120	mg/kg	8/02/2015
Extraction: SW846-3550A		Complete			7/31/2015

Surrogate	Percent Recovery	Recovery Limits
n-Triacontane	87.9	(37 - 137)

EA GROUP
Environmental Analysis and Management

EAG Workorder 1507-00396
EAG ID: 1507-00396-007
Client ID: SME 3 8-9
Client Project: Hunt's Sunoco

Matrix: Solid
Analyst: JAH

Date Sampled: 07/27/2015
Time Sampled: 1410
Date Received: 07/28/2015

Parameter	CAS #	Result	Reporting Limit	Units	Date Analyzed
Total Petroleum Hydrocarbons: SW846-8015M					
Extractable Petroleum Hydrocarbons: C10-C20		<130	130	mg/kg	8/02/2015
Extractable Petroleum Hydrocarbons: C20-C34		<130	130	mg/kg	8/02/2015
Extraction: SW846-3550A		Complete			7/31/2015

Surrogate	Percent Recovery	Recovery Limits
n-Triacontane	82.5	(37 - 137)

EA GROUP
Environmental Analysis and Management

EAG Workorder 1507-00396
EAG ID: 1507-00396-008
Client ID: SME 3 10-12
Client Project: Hunt's Sunoco

Matrix: Solid
Analyst: JAH

Date Sampled: 07/27/2015
Time Sampled: 1410
Date Received: 07/28/2015

Parameter	CAS #	Result	Reporting Limit	Units	Date Analyzed
Total Petroleum Hydrocarbons: SW846-8015M					
Extractable Petroleum Hydrocarbons: C10-C20		<130	130	mg/kg	8/02/2015
Extractable Petroleum Hydrocarbons: C20-C34		<130	130	mg/kg	8/02/2015
Extraction: SW846-3550A		Complete			7/31/2015

Surrogate	Percent Recovery	Recovery Limits
n-Triacontane	80.6	(37 - 137)

EA GROUP
Environmental Analysis and Management

EAG Workorder 1507-00396
EAG ID: 1507-00396-011
Client ID: Dup 1
Client Project: Hunt's Sunoco

Matrix: Solid
Analyst: JAH

Date Sampled: 07/27/2015
Time Sampled:
Date Received: 07/28/2015

Parameter	CAS #	Result	Reporting Limit	Units	Date Analyzed
Total Petroleum Hydrocarbons: SW846-8015M					
Extractable Petroleum Hydrocarbons: C10-C20		<130	130	mg/kg	8/02/2015
Extractable Petroleum Hydrocarbons: C20-C34		<130	130	mg/kg	8/02/2015
Extraction: SW846-3550A		Complete			7/31/2015

Surrogate	Percent Recovery	Recovery Limits
n-Triacontane	85.2	(37 - 137)

EA GROUP

7118 INDUSTRIAL PARK BLVD. MENTOR, OHIO 44060-5314
(440) 951-3514 FAX (440) 951-3774 (800) 875-3514
website: www.eagroup-ohio.com customerservice@eagroup-ohio.com

CHAIN OF CUSTODY

PLEASE DO NOT SEPARATE FORMS

SEE REVERSE FOR HOLD TIME RESTRICTIONS

EAG WORK ORDER # 396

PAGE 1 OF 1

Company Name	SME	
Report Address	9375 Chillicothe Road	
City	Kirtland	State OH Zip 44094
Billing Address	43980 Plymouth Oaks Blvd	
City	Plymouth	State MI Zip 48170
Phone	440-256-6500	Fax 440-256-6507
Report Attention	Nana Proto proto@smeusa.com	
Project Name	Hunt's Sunoco	
P.O. # Quote #	06E708-01.004-005	

TURNAROUND (✓)

RUSH ____

NORMAL ✓

RESULTS (✓)

E-MAIL ✓

FAX ____

COOLER TEMP: 5.8°C ice

SAMPLE IDENTIFICATION	MATRIX	COLLECTION TIME	COLLECTION DATE	ANALYSIS REQUESTED: TPH DRO	TPC	SAMPLE REMARKS: CONDITION, ETC.
SME 1 3-5'	SL	1300	7/27		X	
SME 1 8-9'		1300		X		
SME 1 10-12'		1300		X		
SME 2 8-9		1230		X		
SME 2 10-12		1230		X		
SME 3 2-4		1410			X	
SME 3 8'-9'		1410		X		
SME 3 10'-12'		1410		X		
SME 4 8-9		1436			X	
SME 5 8-9		1500			X	
Dup 1	SL		7/27	X	X	

ALL SERVICES TO BE PERFORMED IN ACCORDANCE WITH STANDARD TERMS AND CONDITIONS

	Date/Time		Date/Time
Relinquished by (sign) Nana Proto	7/28	Received by (sign)	7/28/15 10:30
Relinquished by (sign)		Received by (sign)	
Relinquished by (sign)		Received by (sign)	

Additional Comments / Method Protocol:

- ☐ VAP
- ☑ BUSTR
- ☐ OTHER ____

WHITE - FILE YELLOW - INVOICE PINK - REPORT GREEN - CUSTOMER Rev. 12 12/2002

APPENDIX D
GEOTECHNICAL REPORTS

FALLING HEAD PERMEABILITY
ASTM D5084

SME
9375 CHILLICOTHE ROAD, KIRTLAND, OH 44094
PHONE: 440-256-6500 FAX: 440-256-6507

PROJECT INFORMATION

Project: Ottowa County FY2012 Assess Grnt	Project Number:	066708.01	
Location: Ottowa County, Ohio	Date Started: August 5, 2015	Permeameter Cell Number	6
	Engineer: KE	Sample #:	---

SAMPLE IDENTIFICATION

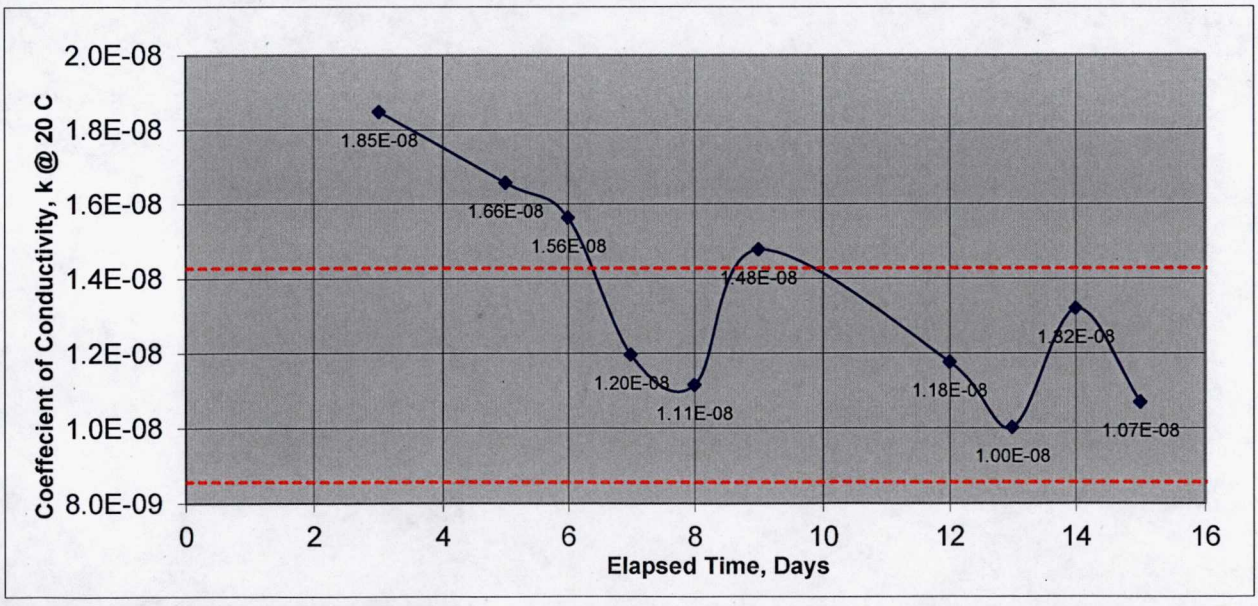
Sample Location	Type of Sample	Description
S-3; 14' - 16'	Remolded	Brown LEAN CLAY with sand

SAMPLE PREPARATION

Dry Unit Weight Maximum, pcf	Moisture Content Optimum, %	Actual Sample Compaction, %	Method of Compaction
----	----	----	---

TEST CONDITIONS

Initial Head Height (inches)	Permeant Liquid	Initial Stone & Resevoir Water Conditions
60.5	Tap Water	Moist Stones with 13.5 psi confining pressure



	Initial	Final
Void Ratio, e	0.64	0.64
Saturation, S%	86	100
Porosity, n%	39	39
Water Content, w%	21	24
Wet Unit Weight	122	126
Dry Unit Weight	101	101
Specific Gravity	2.66	2.66

Coefficient of Conductivity, k@20C, cm/sec Average of last 4 test cycles
0.0000000114 **1.14E-08**

FALLING HEAD PERMEABILITY
ASTM D5084

SME
9375 CHILLICOTHE ROAD, KIRTLAND, OH 44094
PHONE: 440-256-6500 FAX: 440-256-6507

PROJECT INFORMATION

Project: Ottowa County FY2012 Assess Grnt	Project Number:	066708.01	
Location: Ottowa County, Ohio	Date Started: August 5, 2015	Permeameter Cell Number	1
	Engineer: KE	Sample #:	---

SAMPLE IDENTIFICATION

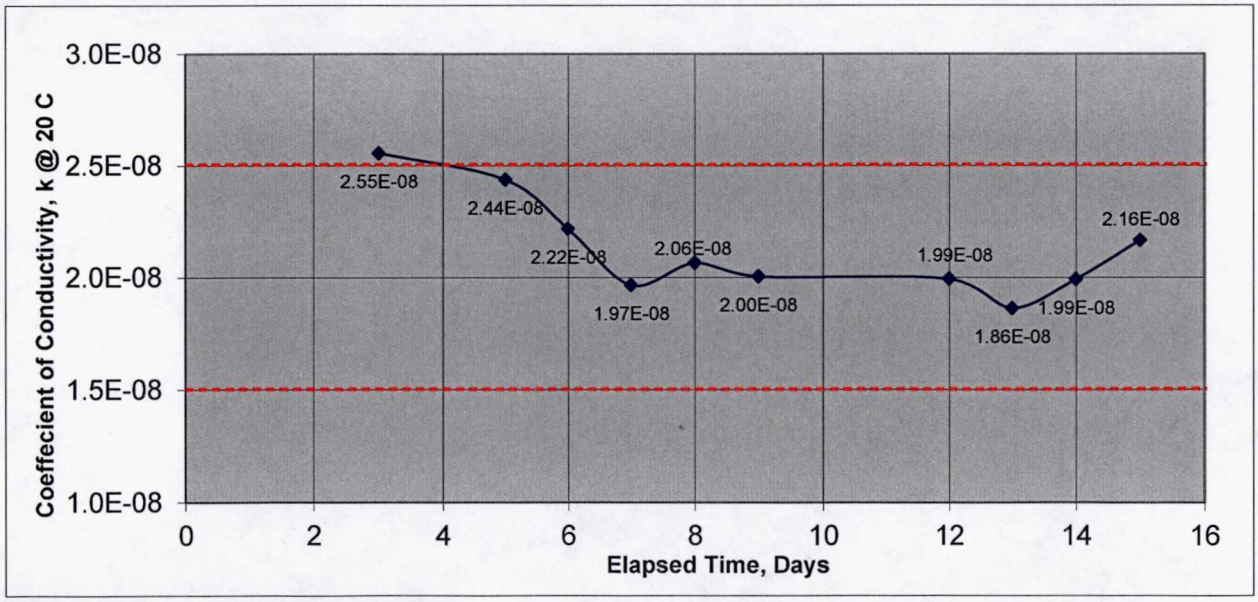
Sample Location	Type of Sample	Description
S-4; 10' - 12'	Remolded	Brown LEAN CLAY

SAMPLE PREPARATION

Dry Unit Weight Maximum, pcf	Moisture Content Optimum, %	Actual Sample Compaction, %	Method of Compaction
----	----	----	---

TEST CONDITIONS

Initial Head Height (inches)	Permeant Liquid	Initial Stone & Resevoir Water Conditions
60.5	Tap Water	Moist Stones with 10 psi confining pressure



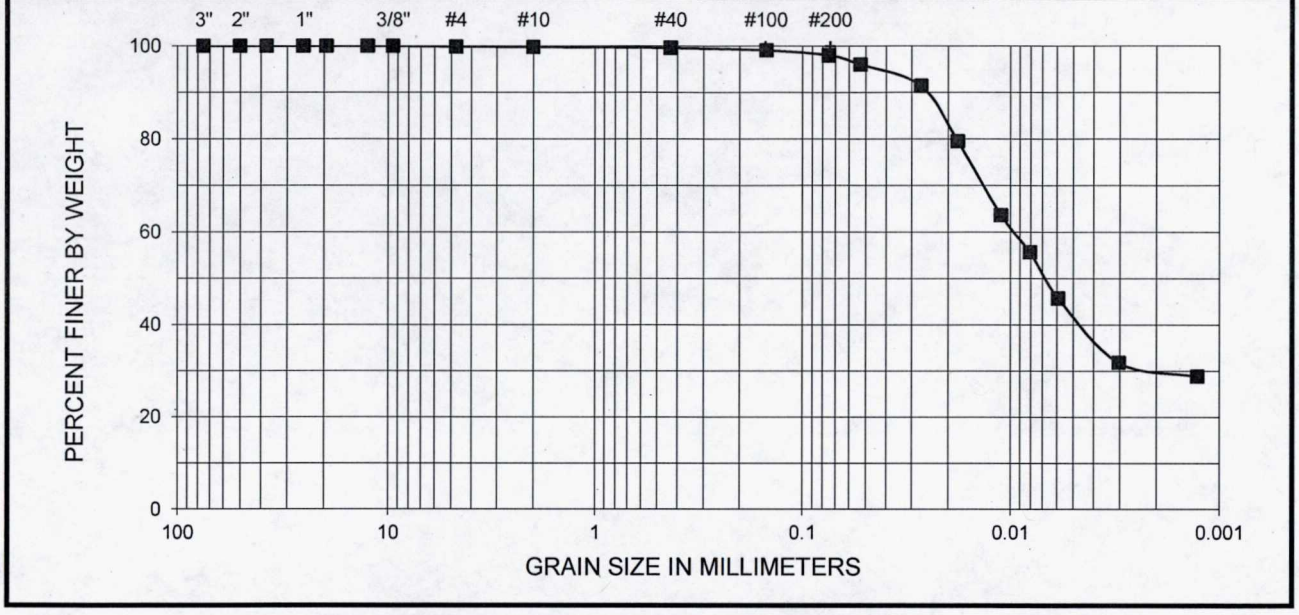
	Initial	Final
Void Ratio, e	0.53	0.53
Saturation, S%	95	100
Porosity, n%	35	35
Water Content, w%	19	19
Wet Unit Weight	132	133
Dry Unit Weight	112	112
Specific Gravity	2.74	2.74

Coefficient of Conductivity, k@20C, cm/sec Average of last 4 test cycles
0.0000000200 **2.00E-08**

9375 Chillicothe Road
Kirtland, Ohio
44094-8501
Phone: 440-256-6500
Fax: 440-256-6507
www.sme-usa.com
Soil and Materials Engineers, Inc.

PARTICLE SIZE ANALYSIS WITH HYDROMETER ASTM D422

PROJECT INFORMATION		SAMPLE INFORMATION		
Project:	Ottowa County FY2012 Assess Grnt	***ASTM Description***	Gray LEAN CLAY	CL
Location:	Ottowa County, Ohio	***OHIO Modified AASHTO***	Gray SANDY SILT	A-4a (8)
Project #:	066708.01			
Test Date:	August 6, 2015	***Sample Location***	S-1; 8' - 12'	
Sample #:	---			



SIEVE ANALYSIS

Sieve #	Sieve size, mm	Percent Passing
3"	75	100.0
2"	50	100.0
1-1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	99.9
#10	2	99.8
#40	0.43	99.6
#100	0.15	99.1
#200	0.074	98.1
#270	0.053	96.1

DISPERSION

Device	ASTM D422, Type A
Agent	Sodium Hexametaphosphate
Time in Agent	16 Hours

HYDROMETER ANALYSIS

Particle Size	Percent Passing
0.074 mm	98.1
0.053 mm	96.1
0.005 mm	41.5
0.0013 mm	28.8

ATTERBERG LIMITS

LIQUID LIMIT	29
PLASTIC LIMIT	19
PLASTICITY INDEX	10

PARTICLE DISTRIBUTION

D_{10}	NA	mm
D_{30}	0.002	mm
D_{60}	0.010	mm
C_c	NA	
C_u	NA	

SAND AND GRAVEL DESCRIPTION

SHAPE	Angular
HARDNESS	Hard and durable

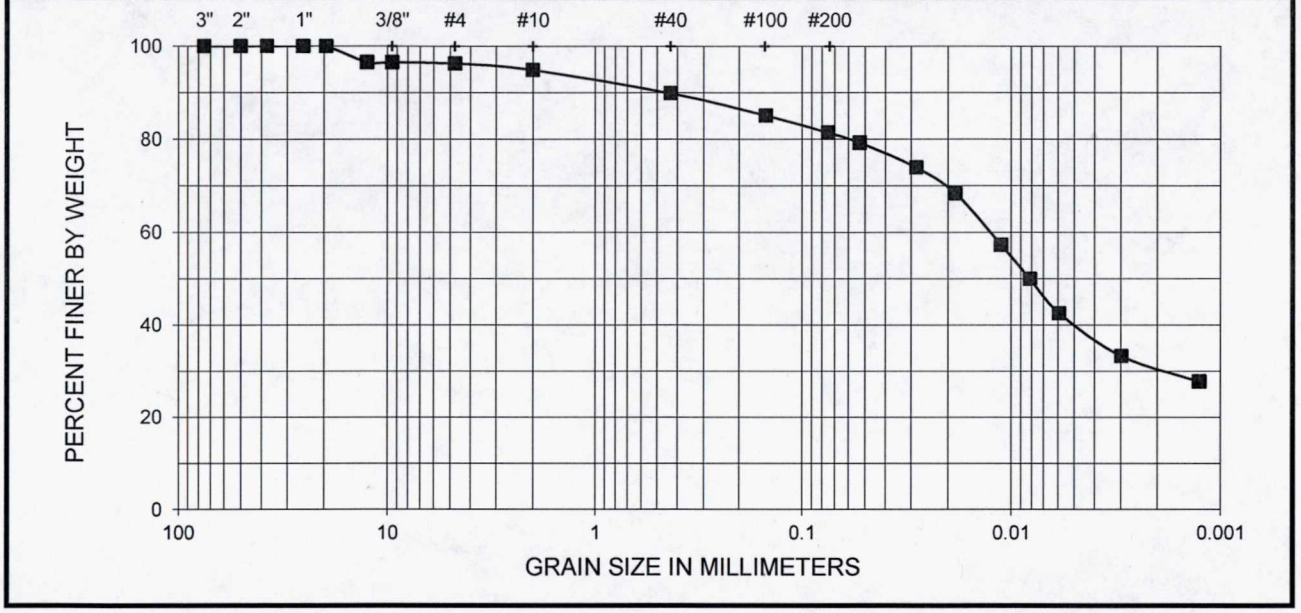
9375 Chillicothe Road
Kirtland, Ohio
44094-8501

Phone: 440-256-6500
Fax: 440-256-6507
www.sme-usa.com

Soil and Materials Engineers, Inc.

PARTICLE SIZE ANALYSIS WITH HYDROMETER ASTM D422

PROJECT INFORMATION		SAMPLE INFORMATION		
Project:	Ottowa County FY2012 Assess Grnt	***ASTM Description***	Gray LEAN CLAY with sand	CL
Location:	Ottowa County, Ohio	***OHIO Modified AASHTO***	Gray SANDY SILT	A-4a (8)
Project #:	066708.01			
Test Date:	August 6, 2015	***Sample Location***	S-2; 10' - 12'	
Sample #:	---			



SIEVE ANALYSIS

Sieve #	Sieve size, mm	Percent Passing
3"	75	100.0
2"	50	100.0
1-1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	96.6
#4	4.75	96.3
#10	2	94.9
#40	0.43	89.9
#100	0.15	85.2
#200	0.074	81.4
#270	0.053	79.3

DISPERSION

Device	ASTM D422, Type A
Agent	Sodium Hexametaphosphate
Time in Agent	16 Hours

HYDROMETER ANALYSIS

Particle Size	Percent Passing
0.074 mm	81.4
0.053 mm	79.3
0.005 mm	39.9
0.0013 mm	27.7

ATTERBERG LIMITS

LIQUID LIMIT	27
PLASTIC LIMIT	17
PLASTICITY INDEX	10

PARTICLE DISTRIBUTION

D_{10}	NA	mm
D_{30}	0.002	mm
D_{60}	0.013	mm
C_c	NA	
C_u	NA	

SAND AND GRAVEL DESCRIPTION

SHAPE	Angular
HARDNESS	Hard and durable

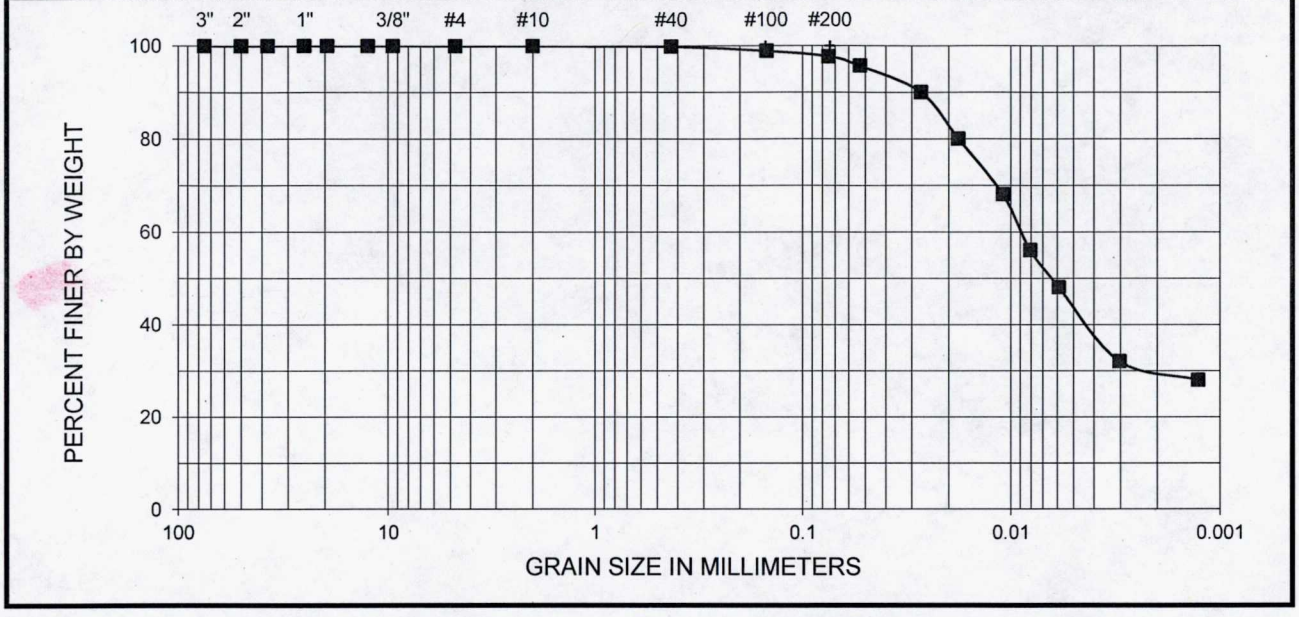
9375 Chillicothe Road
Kirtland, Ohio
44094-8501

Phone: 440-256-6500
Fax: 440-256-6507
www.sme-usa.com

Soil and Materials Engineers, Inc.

PARTICLE SIZE ANALYSIS WITH HYDROMETER ASTM D422

PROJECT INFORMATION		SAMPLE INFORMATION		
Project:	Ottowa County FY2012 Assess Grnt	***ASTM Description***	Brown LEAN CLAY	CL
Location:	Ottowa County, Ohio	***OHIO Modified AASHTO***	Brown SILT and CLAY	A-6a (8)
Project #:	066708.01			
Test Date:	August 6, 2015	***Sample Location***	S-3; 10' - 12'	
Sample #:	---			



SIEVE ANALYSIS

Sieve #	Sieve size, mm	Percent Passing
3"	75	100.0
2"	50	100.0
1-1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2	100.0
#40	0.43	99.9
#100	0.15	98.9
#200	0.074	97.8
#270	0.053	95.8

DISPERSION

Device	ASTM D422, Type A
Agent	Sodium Hexametaphosphate
Time in Agent	16 Hours

HYDROMETER ANALYSIS

Particle Size	Percent Passing
0.074 mm	97.8
0.053 mm	95.8
0.005 mm	43.6
0.0013 mm	28.0

ATTERBERG LIMITS

LIQUID LIMIT	32
PLASTIC LIMIT	21
PLASTICITY INDEX	11

PARTICLE DISTRIBUTION

D_{10}	NA	mm
D_{30}	0.002	mm
D_{60}	0.009	mm
C_c	NA	
C_u	NA	

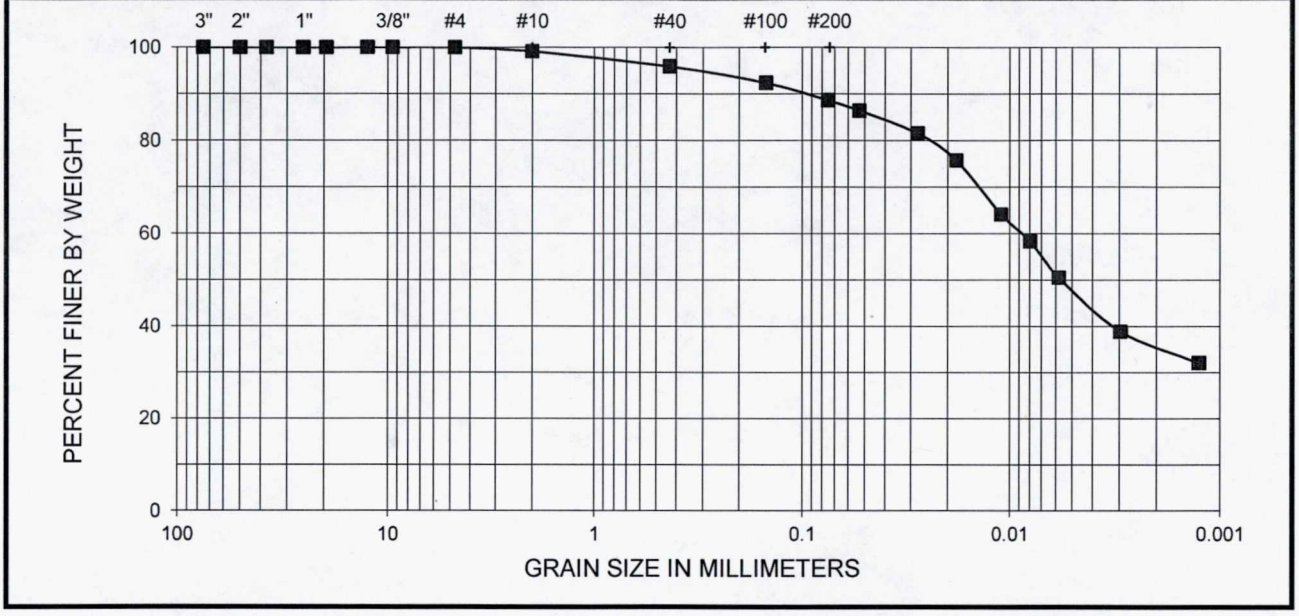
SAND AND GRAVEL DESCRIPTION

SHAPE	Angular
HARDNESS	Hard and durable

9375 Chillicothe Road
Kirtland, Ohio
44094-8501
Phone: 440-256-6500
Fax: 440-256-6507
www.sme-usa.com
Soil and Materials Engineers, Inc.

PARTICLE SIZE ANALYSIS WITH HYDROMETER ASTM D422

PROJECT INFORMATION		SAMPLE INFORMATION		
Project:	Ottowa County FY2012 Assess Grnt	***ASTM Description***	Brown LEAN CLAY	CL
Location:	Ottowa County, Ohio	***OHIO Modified AASHTO***	Brown SILT and CLAY	A-6a (9)
Project #:	066708.01			
Test Date:	August 6, 2015	***Sample Location***	S-4; 6' - 10'	
Sample #:	---			



SIEVE ANALYSIS

Sieve #	Sieve size, mm	Percent Passing
3"	75	100.0
2"	50	100.0
1-1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	100.0
#10	2	99.2
#40	0.43	95.9
#100	0.15	92.4
#200	0.074	88.6
#270	0.053	86.5

DISPERSION

Device	ASTM D422, Type A
Agent	Sodium Hexametaphosphate
Time in Agent	16 Hours

HYDROMETER ANALYSIS

Particle Size	Percent Passing
0.074 mm	88.6
0.053 mm	86.5
0.005 mm	47.7
0.0013 mm	32.1

ATTERBERG LIMITS

LIQUID LIMIT	33
PLASTIC LIMIT	20
PLASTICITY INDEX	13

PARTICLE DISTRIBUTION

D_{10}	NA	mm
D_{30}	NA	mm
D_{60}	0.009	mm
C_c	NA	
C_u	NA	

SAND AND GRAVEL DESCRIPTION

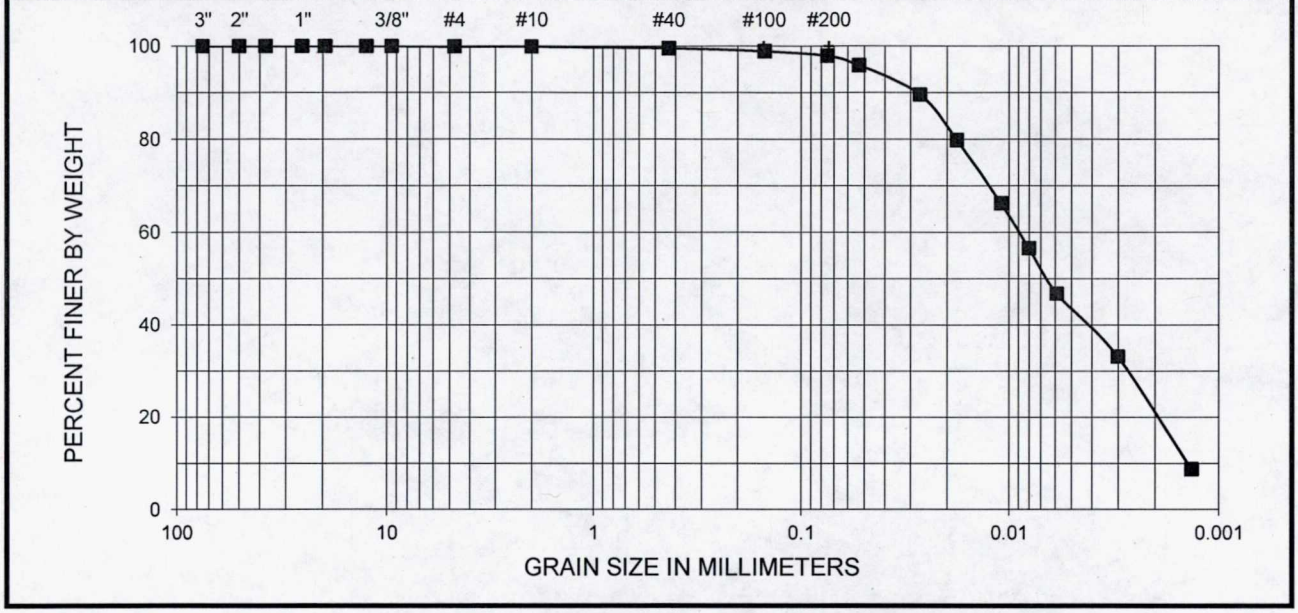
SHAPE	Angular
HARDNESS	Hard and durable

9375 Chillicothe Road
Kirtland, Ohio
44094-8501
Phone: 440-256-6500
Fax: 440-256-6507
www.sme-usa.com
Soil and Materials Engineers, Inc.

PARTICLE SIZE ANALYSIS WITH HYDROMETER ASTM D422

PROJECT INFORMATION	
Project:	Ottowa County FY2012 Assess Grnt
Location:	Ottowa County, Ohio
Project #:	066708.01
Test Date:	August 6, 2015
Sample #:	---

SAMPLE INFORMATION		
ASTM Description	Brown LEAN CLAY	CL
OHIO Modified AASHTO	Brown SILT and CLAY	A-6a (8)
Sample Location	S-5; 6' - 10'	



SIEVE ANALYSIS

Sieve #	Sieve size, mm	Percent Passing
3"	75	100.0
2"	50	100.0
1-1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	100.0
#4	4.75	99.9
#10	2	99.9
#40	0.43	99.6
#100	0.15	99.0
#200	0.074	97.9
#270	0.053	95.9

DISPERSION

Device	ASTM D422, Type A
Agent	Sodium Hexametaphosphate
Time in Agent	16 Hours

HYDROMETER ANALYSIS

Particle Size	Percent Passing
0.074 mm	97.9
0.053 mm	95.9
0.005 mm	43.5
0.0013 mm	8.8

ATTERBERG LIMITS

LIQUID LIMIT	32
PLASTIC LIMIT	21
PLASTICITY INDEX	11

PARTICLE DISTRIBUTION

D_{10}	0.001 mm
D_{30}	0.003 mm
D_{60}	0.009 mm
C_c	0.59
C_u	6.38

SAND AND GRAVEL DESCRIPTION

SHAPE	Angular
HARDNESS	Hard and durable

SME
9375 CHILLICOTHE ROAD, KIRTLAND, OH 44094
PHONE: 440-256-6500 FAX: 440-256-6507

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
ASTM D4318 - A

PROJECT: Ottowa County FY2012 Assess Grnt
LOCATION: Ottowa County, Ohio
PROJECT#: 066708.01
DATE: August 6, 2015

DATE OBTAINED: ---
SAMPLE NUMBER: ---
SAMPLE LOCATION: S-1; 8' - 12'
SAMPLE DESCRIPTION: Gray LEAN CLAY
TECHNICIAN: KJF

TEST METHOD: ASTM D4318
METHOD - A

TEST DATA:

LIQUID LIMIT

Point #:	1	2	3
Wet Wt + Tare, g:	47.34	44.23	44.63
Dry Wt + Tare, g:	44.29	41.81	42.22
Tare Wt.:	34.26	33.47	33.73
Water Content:	30.41	29.02	28.39
Number of Blows:	16	25	34

Water Content corrected for method B:	29

PLASTIC LIMIT TEST

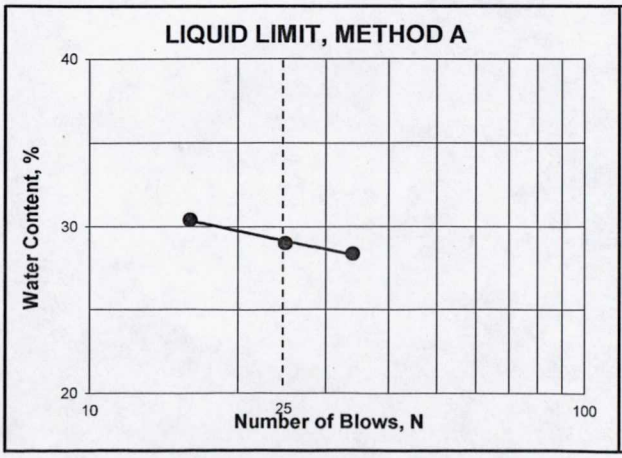
Wet Wt + Tare, g:	40.00	40.71
Dry Wt + Tare, g:	38.91	39.57
Tare Wt, g:	33.22	33.70
Water Content:	19.16	19.42

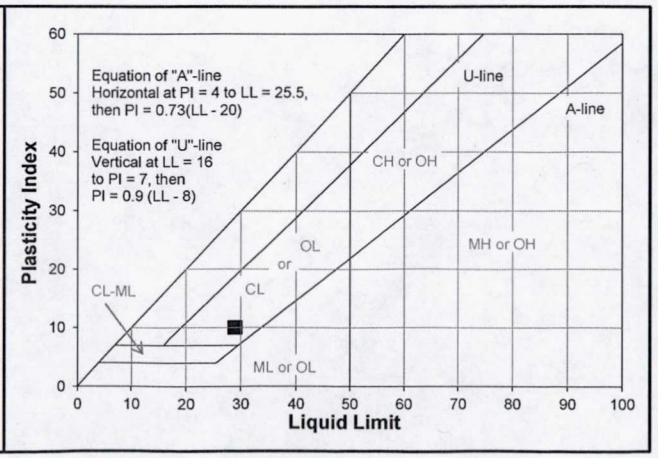
PLASTICITY INDEX

LIQUID LIMIT:	29
PLASTIC LIMIT:	19
PLASTICITY INDEX:	10

CLASSIFICATION: CL

REMARKS: Sample air dried prior to testing





SME
9375 CHILLICOTHE ROAD, KIRTLAND, OH 44094
PHONE: 440-256-6500 FAX: 440-256-6507

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
ASTM D4318 - A

PROJECT: Ottowa County FY2012 Assess Grnt
LOCATION: Ottowa County, Ohio
PROJECT#: 066708.01
DATE: August 6, 2015

DATE OBTAINED: ---
SAMPLE NUMBER: ---
SAMPLE LOCATION: S-2; 10' - 12'
SAMPLE DESCRIPTION: Gray LEAN CLAY
TECHNICIAN: KJF

TEST METHOD: ASTM D4318
METHOD - A

TEST DATA:

LIQUID LIMIT

Point #:	1	2	3
Wet Wt + Tare, g:	46.11	49.58	46.45
Dry Wt + Tare, g:	43.34	46.83	43.79
Tare Wt.:	33.68	36.60	33.49
Water Content:	28.67	26.88	25.83
Number of Blows:	16	23	31

Water Content corrected for method B:	27

PLASTIC LIMIT TEST

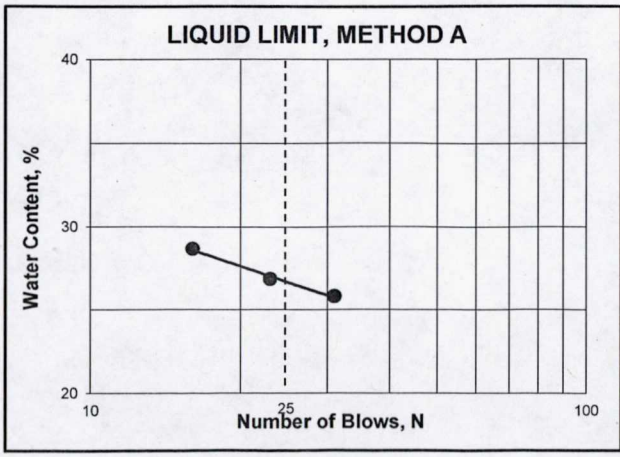
Wet Wt + Tare, g:	40.49	40.43
Dry Wt + Tare, g:	39.44	39.42
Tare Wt, g:	33.47	33.56
Water Content:	17.59	17.24

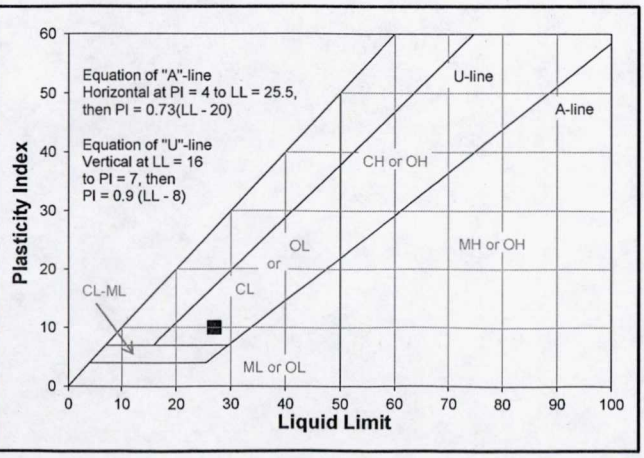
PLASTICITY INDEX

LIQUID LIMIT:	27
PLASTIC LIMIT:	17
PLASTICITY INDEX:	10

CLASSIFICATION: CL

REMARKS: Sample air dried prior to testing





SME
9375 CHILLICOTHE ROAD, KIRTLAND, OH 44094
PHONE: 440-256-6500 FAX: 440-256-6507

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
ASTM D4318 - A

PROJECT: Ottowa County FY2012 Assess Grnt
LOCATION: Ottowa County, Ohio
PROJECT#: 066708.01
DATE: August 6, 2015

DATE OBTAINED: ---
SAMPLE NUMBER: ---
SAMPLE LOCATION: S-3; 10' - 12'
SAMPLE DESCRIPTION: Brown LEAN CLAY
TECHNICIAN: KJF

TEST METHOD: ASTM D4318
METHOD - A

TEST DATA:

LIQUID LIMIT

Point #:	1	2	3
Wet Wt + Tare, g:	43.80	42.53	44.91
Dry Wt + Tare, g:	41.35	40.32	42.36
Tare Wt.:	34.05	33.42	33.70
Water Content:	33.56	32.03	29.45
Number of Blows:	19	24	33

Water Content corrected for method B:	32

PLASTIC LIMIT TEST

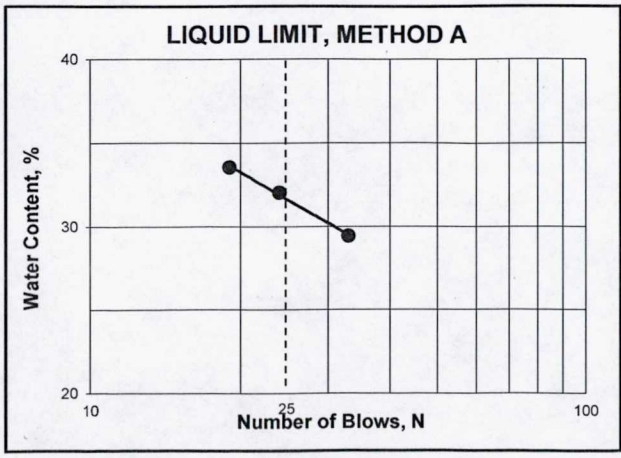
Wet Wt + Tare, g:	43.47	40.57
Dry Wt + Tare, g:	42.30	39.43
Tare Wt, g:	36.62	33.96
Water Content:	20.60	20.84

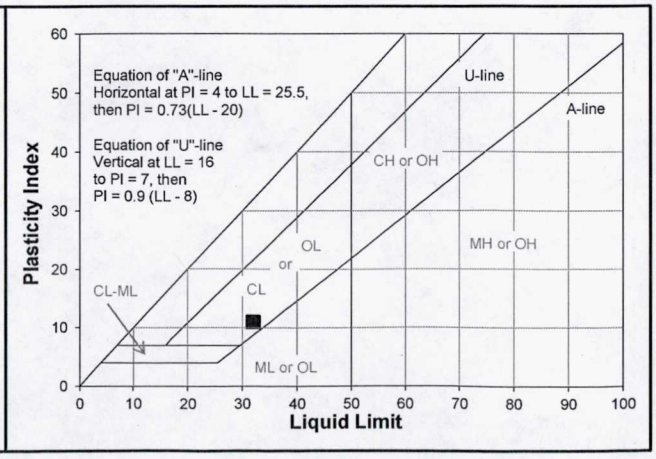
PLASTICITY INDEX

LIQUID LIMIT:	32
PLASTIC LIMIT:	21
PLASTICITY INDEX:	11

CLASSIFICATION: CL

REMARKS: Sample air dried prior to testing





SME
9375 CHILLICOTHE ROAD, KIRTLAND, OH 44094
PHONE: 440-256-6500 FAX: 440-256-6507

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
ASTM D4318 - A

PROJECT: Ottowa County FY2012 Assess Grnt
LOCATION: Ottowa County, Ohio
PROJECT#: 066708.01
DATE: August 6, 2015

DATE OBTAINED: ---
SAMPLE NUMBER: ---
SAMPLE LOCATION: S-4; 6' - 10'
SAMPLE DESCRIPTION: Brown LEAN CLAY
TECHNICIAN: KJF

TEST METHOD: ASTM D4318
METHOD - A

TEST DATA:

LIQUID LIMIT

Point #:	1	2	3
Wet Wt + Tare, g:	47.95	43.99	46.86
Dry Wt + Tare, g:	45.00	41.32	44.36
Tare Wt.:	36.60	33.59	36.64
Water Content:	35.12	34.54	32.38
Number of Blows:	15	20	30

Water Content corrected for method B:	34

PLASTIC LIMIT TEST

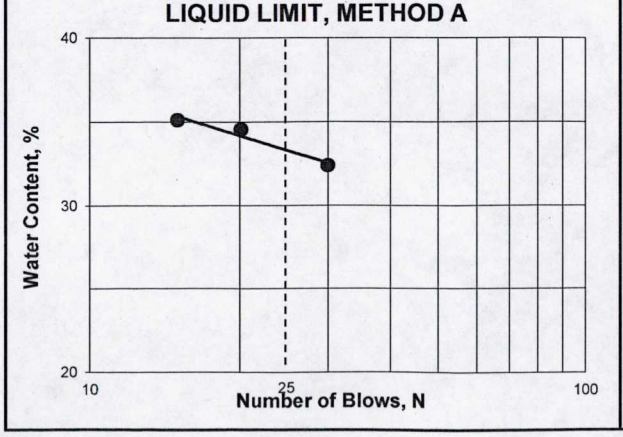
Wet Wt + Tare, g:	40.39	43.32
Dry Wt + Tare, g:	39.28	42.20
Tare Wt, g:	33.67	36.58
Water Content:	19.79	19.93

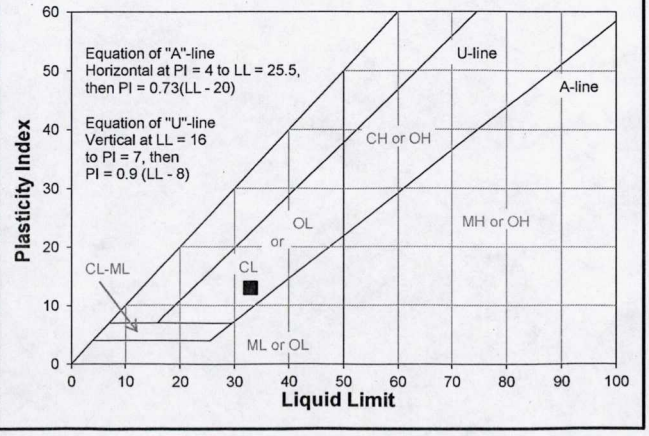
PLASTICITY INDEX

LIQUID LIMIT:	33
PLASTIC LIMIT:	20
PLASTICITY INDEX:	13

CLASSIFICATION: CL

REMARKS: Sample air dried prior to testing





SME
9375 CHILLICOTHE ROAD, KIRTLAND, OH 44094
PHONE: 440-256-6500 FAX: 440-256-6507

LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
ASTM D4318 - A

PROJECT: Ottowa County FY2012 Assess Grnt
LOCATION: Ottowa County, Ohio
PROJECT#: 066708.01
DATE: August 6, 2015

DATE OBTAINED: ---
SAMPLE NUMBER: ---
SAMPLE LOCATION: S-5; 6' - 10'
SAMPLE DESCRIPTION: Brown LEAN CLAY
TECHNICIAN: KJF

TEST METHOD: ASTM D4318
METHOD - A

TEST DATA:

LIQUID LIMIT

Point #:	1	2	3
Wet Wt + Tare, g:	44.54	44.09	44.49
Dry Wt + Tare, g:	41.94	41.56	41.82
Tare Wt.:	34.24	33.65	33.22
Water Content:	33.77	31.98	31.05
Number of Blows:	15	25	34

Water Content corrected for method B:	32

PLASTIC LIMIT TEST

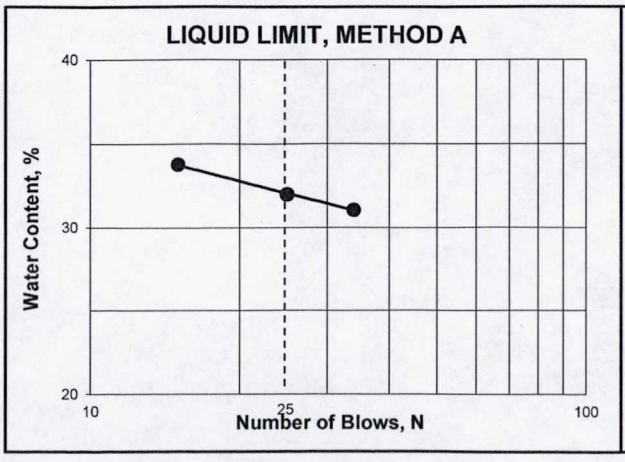
Wet Wt + Tare, g:	40.83	43.67
Dry Wt + Tare, g:	39.63	42.44
Tare Wt, g:	33.68	36.58
Water Content:	20.17	20.99

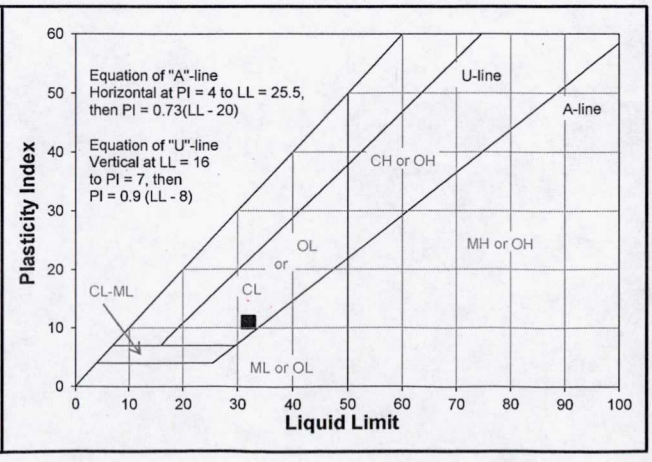
PLASTICITY INDEX

LIQUID LIMIT:	32
PLASTIC LIMIT:	21
PLASTICITY INDEX:	11

CLASSIFICATION: CL

REMARKS: Sample air dried prior to testing





APPENDIX E
PROUCL DOCUMENTATION

Outlier Tests for Selected Variables

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for TPH

Number of data = 22

10% critical value: 0.382

5% critical value: 0.43

1% critical value: 0.514

1. Data Value 21300 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.970

For 10% significance level, 21300 is an outlier.

For 5% significance level, 21300 is an outlier.

For 1% significance level, 21300 is an outlier.

2. Data Value 3.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.007

For 10% significance level, 3.4 is not an outlier.

For 5% significance level, 3.4 is not an outlier.

For 1% significance level, 3.4 is not an outlier.

Rosner's Outlier Test for Benzene

Mean	**0.0556**
Standard Deviation	**0.146**
Number of data	**32**
Number of suspected outliers	**1**

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0556	0.144	0.691	27	4.427	2.94	3.27

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.691 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

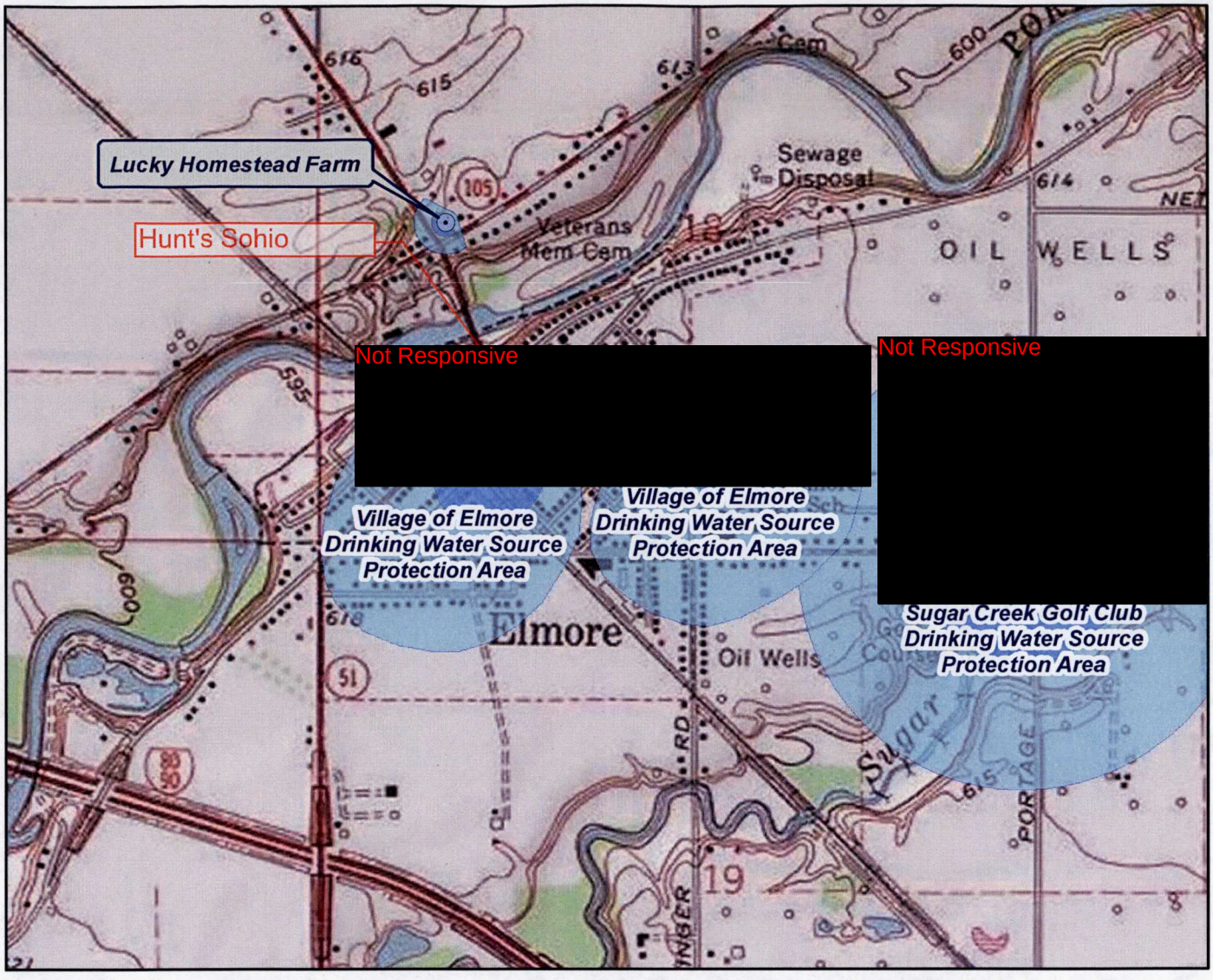
Therefore, Observation 0.691 is a Potential Statistical Outlier

1				**General UCL Statistics for Full Data Sets**								
2			**User Selected Options**									
3			From File	WorkSheet.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	**TPH**											
10												
11						**General Statistics**							
12					Number of Valid Observations	22				Number of Distinct Observations	17	
13												
14				**Raw Statistics**						**Log-transformed Statistics**		
15					Minimum	3.4				Minimum of Log Data	1.224	
16					Maximum	21300				Maximum of Log Data	9.966	
17					Mean	1287				Mean of log Data	5.222	
18					Geometric Mean	185.3				SD of log Data	2.045	
19					Median	354.5						
20					SD	4478						
21					Std. Error of Mean	954.7						
22					Coefficient of Variation	3.478						
23					Skewness	4.663						
24												
25						**Relevant UCL Statistics**						
26				**Normal Distribution Test**						**Lognormal Distribution Test**		
27					Shapiro Wilk Test Statistic	0.266				Shapiro Wilk Test Statistic	0.854	
28					Shapiro Wilk Critical Value	0.911				Shapiro Wilk Critical Value	0.911	
29				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
30												
31				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
32					95% Student's-t UCL	2930				95% H-UCL	10043	
33				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	4011	
34					95% Adjusted-CLT UCL (Chen-1995)	3872				97.5% Chebyshev (MVUE) UCL	5236	
35					95% Modified-t UCL (Johnson-1978)	3088				99% Chebyshev (MVUE) UCL	7643	
36												
37				**Gamma Distribution Test**						**Data Distribution**		
38					k star (bias corrected)	0.33				**Data do not follow a Discernable Distribution (0.05)**		
39					Theta Star	3898						
40					MLE of Mean	1287						
41					MLE of Standard Deviation	2240						
42					nu star	14.53						
43					Approximate Chi Square Value (.05)	6.938				**Nonparametric Statistics**		
44					Adjusted Level of Significance	0.0386				95% CLT UCL	2858	
45					Adjusted Chi Square Value	6.548				95% Jackknife UCL	2930	
46										95% Standard Bootstrap UCL	2842	
47					Anderson-Darling Test Statistic	2.39				95% Bootstrap-t UCL	18831	
48					Anderson-Darling 5% Critical Value	0.837				95% Hall's Bootstrap UCL	12543	
49					Kolmogorov-Smirnov Test Statistic	0.365				95% Percentile Bootstrap UCL	3180	
50					Kolmogorov-Smirnov 5% Critical Value	0.2				95% BCA Bootstrap UCL	4158	
51				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	5449	
52										97.5% Chebyshev(Mean, Sd) UCL	7249	

	A	B	C	D	E	F	G	H	I	J	K	L
53	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					10786
54	95% Approximate Gamma UCL (Use when n >= 40)					2697						
55	95% Adjusted Gamma UCL (Use when n < 40)					2857						
56												
57	**Potential UCL to Use**						Use 97.5% Chebyshev (Mean, Sd) UCL					7249
58												
59	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
60	**These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)**											
61	**and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.**											
62												
63												
64	**Benzene**											
65												
66	**General Statistics**											
67	Number of Valid Observations					32	Number of Distinct Observations					11
68												
69	**Raw Statistics**						**Log-transformed Statistics**					
70	Minimum					0.002	Minimum of Log Data					-6.215
71	Maximum					0.691	Maximum of Log Data					-0.37
72	Mean					0.0556	Mean of log Data					-4.578
73	Geometric Mean					0.0103	SD of log Data					1.44
74	Median					0.006						
75	SD					0.146						
76	Std. Error of Mean					0.0258						
77	Coefficient of Variation					2.621						
78	Skewness					3.391						
79												
80	**Relevant UCL Statistics**											
81	**Normal Distribution Test**						**Lognormal Distribution Test**					
82	Shapiro Wilk Test Statistic					0.414	Shapiro Wilk Test Statistic					0.617
83	Shapiro Wilk Critical Value					0.93	Shapiro Wilk Critical Value					0.93
84	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
85												
86	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
87	95% Student's-t UCL					0.0993	95% H-UCL					0.0631
88	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0654
89	95% Adjusted-CLT UCL (Chen-1995)					0.115	97.5% Chebyshev (MVUE) UCL					0.0819
90	95% Modified-t UCL (Johnson-1978)					0.102	99% Chebyshev (MVUE) UCL					0.114
91												
92	**Gamma Distribution Test**						**Data Distribution**					
93	k star (bias corrected)					0.375	**Data do not follow a Discernable Distribution (0.05)**					
94	Theta Star					0.148						
95	MLE of Mean					0.0556						
96	MLE of Standard Deviation					0.0908						
97	nu star					24.02						
98	Approximate Chi Square Value (.05)					13.86	**Nonparametric Statistics**					
99	Adjusted Level of Significance					0.0416	95% CLT UCL					0.098
100	Adjusted Chi Square Value					13.45	95% Jackknife UCL					0.0993
101							95% Standard Bootstrap UCL					0.0984
102	Anderson-Darling Test Statistic					7.448	95% Bootstrap-t UCL					0.16
103	Anderson-Darling 5% Critical Value					0.835	95% Hall's Bootstrap UCL					0.112
104	Kolmogorov-Smirnov Test Statistic					0.439	95% Percentile Bootstrap UCL					0.102

	A	B	C	D	E	F	G	H	I	J	K	L
105					Kolmogorov-Smirnov 5% Critical Value	0.167					95% BCA Bootstrap UCL	0.116
106					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.168
107											97.5% Chebyshev(Mean, Sd) UCL	0.217
108					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.312
109					95% Approximate Gamma UCL (Use when n >= 40)	0.0964						
110					95% Adjusted Gamma UCL (Use when n < 40)	0.0993						
111												
112					**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	0.168
113												
114	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
115	**These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)**											
116	**and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.**											
117												

APPENDIX F
DWSPA DOCUMENTATION



Legend

- Public Water System Intakes
- Public Water System Wells
- Sole Source Aquifers

Drinking Water Source Protection Areas (ground water)

- Inner Management Zones
- Source Water Protection Areas

Drinking Water Source Protection Areas (surface water)

- Emergency Management Zone
- Corridor Management Zone
- Source Water Area Watershed
- Ohio River-Zone of Critical Concern
- Ohio River-Zone of High Concern
- Ohio River-Source Water Area Watershed
- Lake Erie-Critical Assessment Zone
- Lake Erie-Potential Influence Zone

Project Request

Drinking Water Source Protection Areas, Public Water System wells and intakes, and Sole Source Aquifers near the Village of Elmore, Ottawa County, Ohio.

Requested by: Keith Egan, SME
Map completed by: Linda Slattery, Ohio EPA/DDAGW
Date: August 6, 2015

Disclaimer: Delineations of source water protection areas are ongoing. As a result, this map may not include all source water protection areas for public water systems in the area depicted.

0 500 1,000 2,000 Feet

Ohio Environmental Protection Agency

Drinking Water Source Protection Areas

http://epa.ohio.gov/ddagw/swap.aspx

APPENDIX G
BUSTR SPREADSHEET

2005 BUSTR Tier 2 Soil Leaching to Groundwater Pathway Evalua

Version 2.0 (March 2005)

Chemical of Concern	Chemical Name	GW A.L. mg/l	K_{oc} L/kg	H' Dimensionless	Degradation Rate day-1
Benzene					

Use only if "Other" is selected as Chemical of Concern

Soil Type

Soil Class 2

Site Name (Title 1)

Hunt's Sohio

Left Page Footer 1

Right Page Footer 1 (Release Number)

Print

Reset

Depth of Groundwater from Source (feet)

8

Site Address

Rice Street, Elmore, Ohio

Left Page Footer 2

Right Page Footer 2

Filename

Groundwater Determination

Drinking Water

2005 Soil Leaching to Drinking Water
Hunt's Sohio
Rice Street, Elmore, Ohio

Table 1

Tier 2 SSTL Calculations
(Benzene - Soil Class 2)

Description	Source	Symbol	Value	Units	Reference
Chemical Specific Parameters For Benzene					
Action Level (water)	GW Ingestion AL	AL_w	5.00E-3	mg/l	
Organic Carbon / Water Coefficient	Default	K_{oc}	6.17E+01	L/kg	
Henry's Law Constant	Default	H'	2.28E-01	-	
Degradation Rate	Default	k	9.60E-04	day^{-1}	
Pathway Specific Parameters Based on Soil Type Soil Class 2					
Depth from source to water table	8.0 Feet	L	243.84	cm	
Fraction Organic Carbon	Site Specific / 0.0025	F_{oc}	0.0017	g oc/g soil	Lab test - mean
Dry Bulk Soil Density	Default	ρ_s	1.6	g/cm^3	
Saturated Hydraulic Conductivity	Default	K_s	4.17E-05	cm/sec	
Wetting Front Suction Head	Default	Ψ	-21.85	cm	
Porosity of Soil in Vadose	Default	Θ_T	0.43	cm^3/cm^3	
Volumetric Water Content	Site Specific / 0.15	Θ_{ws}	0.308	cm^3/cm^3	Lab test - mean
Groundwater Darcy Velocity	Default	U_{gw}	2500	cm/yr	
Groundwater Mixing Zone Thickness	Default	δ_{gw}	200	cm	
Infiltration Rate	Default	I	20.32	cm/yr	
Ponding Depth	Default	h	0	cm	
Width of Source Parallel to GW Flow	Site Specific / 1500	W	1127.76	cm	GP10-GP6 (ND)
Calculated Parameters					
Unsaturated Hydraulic Conductivity	Site Specific / 2.09E-05	K_u	2.00E-08	cm/sec	Lab test
Air Filled Porosity	$\Theta_T - \Theta_{ws}$	Θ_{as}	0.122	cm^3/cm^3	Lab test
Partitioning Coefficient	Koc x Foc	K_d	1.05E-01	ml/g	
Calculated Values[1]					
Soil to GW SSTL w/o Degradation	Equation 1	$SSTL_{no\ deg}$	3.59E-02	mg/kg	
Soil to GW Leaching Factor	Equation 2	LF_{sw}	1.39E-01	mg/l / mg/kg	
Time for water to move from source to GW	Equation 3.1	t	1.15E+04	day	
Vertical Seepage Velocity of Water	Equation 3.2	V_w	2.12E-02	cm/day	
Velocity of COCs	Equation 3.3	V_c	1.52E-02	cm/day	
Travel Time for COCs to reach GW	Equation 3.4	t_c	1.60E+04	day	
Ratio of Final COC Conc. to Initial COC Conc.	Equation 3.5	C_f/C_w	2.11E-07	-	
SSTL for Soil to GW w/ Degradation	Equation 4	SSTL	**1.70E+05**	mg/kg	

[1]Equations presented in Table 2.

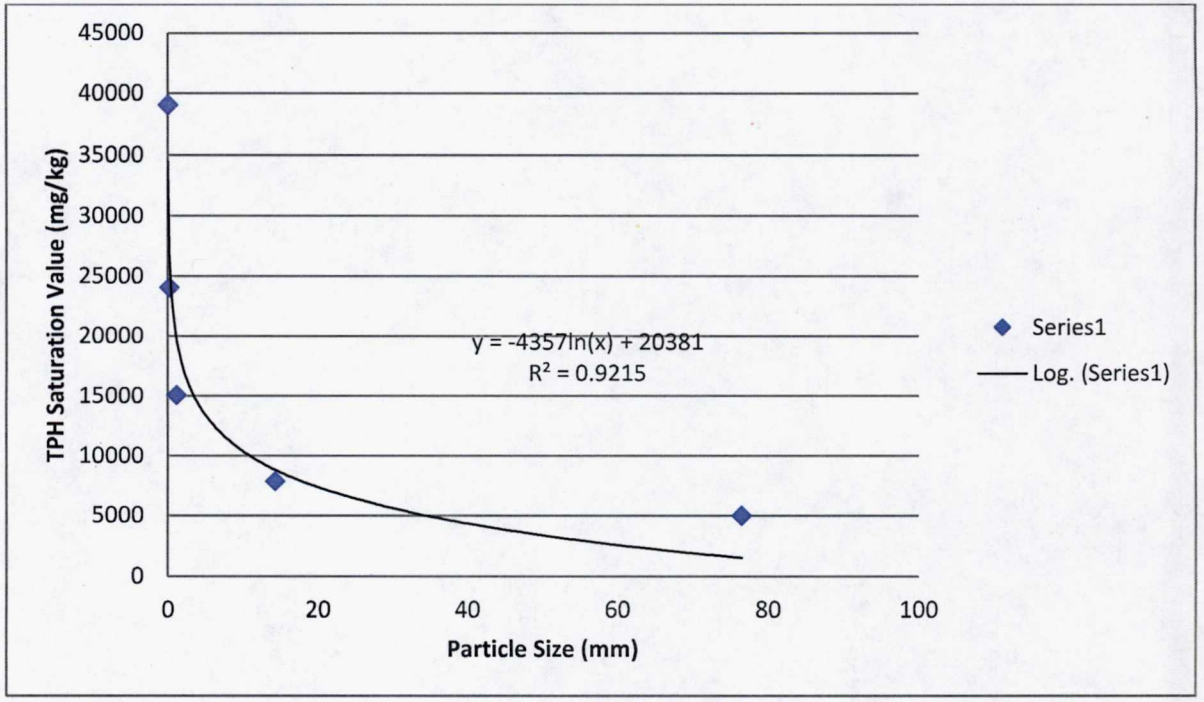
APPENDIX H
TPH SATURATION DETERMINATION

H-1

Estimation of TPH Saturation Values Based on Particle Size

From Table 4, API Pub 1629	
Particle Size	**TPH Saturation**
76.5	4900
14.28	7800
1.2125	15000
0.25	24000
0.0395	39000

lean clay particle size = 0.005 mm
TPH of lean clay = -4357ln(0.005)+20381
= **43,466**



H-2

From ASTM E2351-06

$$So = \frac{TPH}{1/10^{-6}} * \frac{\rho fb}{\rho o} * 1/\theta$$

Where:

So =	Fraction of Pore Space Filled with Non Aqueous Phase Liquid (oil) (mobility rarely observed at less than 20% saturation)
TPH =	Concentration in mg/kg
ρfb =	Silty Clay Bulk Density (1.7 g/cm^3)
ρo =	Oil Density (0.91 gm/cm^3)
θ =	Total Silty Clay Porosity (0.38)

So = (21,300/1/0.000001)*(1.7/0.91)*1/0.38

So = 10.5%

According to ASTM, the maximum concentration of TPH in soil at site is not mobile.

APPENDIX I
BUSTR LETTERS

Ohio Department of Commerce

Division of State Fire Marshal
Bureau of Underground Storage Tank Regulations
8895 E. Main St. • P.O. Box 687
Reynoldsburg, OH 43068-9009
(614) 752-7938 FAX (614) 752-7942
www.com.state.oh.us

Ted Strickland
Governor

Kimberly A. Zurz
Director

October 10, 2007

Ms. Deborah Orr
U.S. EPA Brownfield Coordinator, Region 5
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3507

Subject: Letter of Support

Dear Ms. Orr:

This letter acknowledges that the Village of Elmore notified the Office of the State Fire Marshal, Bureau of Underground Storage Tank Regulations (BUSTR) of its plans to submit a Petroleum Brownfields Site-Specific Assessment grant proposal for Hunt's Sohio located at 408 Rice Street, Elmore, Ohio.

The applicant provided BUSTR with information regarding the site and property ownership, and requested BUSTR to make the necessary determinations on eligibility for Brownfields funding. Based on the information provided, BUSTR has determined that:

- The State Fire Marshal, BUSTR has determined that this site is of "relatively low risk" as compared with other petroleum-only release sites in Ohio.
- There is no viable responsible party as defined by the U.S. EPA request for proposal publication EPA-OSWER-OBCR-07-09, Section 3.3.2.
- The applicant is a volunteer who is not potentially liable for the petroleum contamination because the applicant has not dispensed petroleum or petroleum products at the site.
- The site is not being cleaned up using LUST trust fund monies, and is not subject to a response under the Oil Pollution Act.
- To the best of our knowledge, no party has been subject to:

  1. A judgment in a court of law or an administrative order issued by an administrative body that would require that party to assess, investigate, or clean up the site; or

  2. A filed enforcement action brought by federal or state authorities, or is party to a citizen suit, that would, if successful, require that party to assess, investigate, or clean up the site.
- The site is not subject to any order issued under 9003(h) of the Solid Waste Disposal Act.

I support the Village of Elmore's Petroleum Brownfield Site-Specific Assessment grant application subject to these conditions.

Sincerely,

Lori Stevens
Acting Bureau Chief

cc: Mr. Lowell Krumnow – Village of Elmore

Department of Commerce
Division of State Fire Marshal
John R. Kasich, Governor
David Goodman, Director

May 20, 2015

Mark Messa
Ottawa Regional Planning Commission
315 Madison St., #107
Port Clinton, OH 43452

RE: **USEPA Brownfield Assessment Grant Eligibility Determination**

Dear Mr. Messa:

This letter acknowledges that the State Fire Marshal, Bureau of Underground Storage Tank Regulations ("BUSTR") was notified of the Ottawa County's plan to submit a Petroleum Brownfield Assessment Grant proposal for the following property:

- **408 Rice St., Elmore, OH 43416 Parcel # 0190096110254000.**

The applicant provided BUSTR with information regarding a brief description of the Parcel history related to the potential presence of petroleum underground storage tanks ("USTs") and requested that BUSTR make the necessary determination on eligibility for Brownfield funding. The Property is currently vacant. The property had been used gasoline service station until 1994. The gasoline station building has been demolished. The Property is currently owned by Ms. Betty Hunt. The site is listed in BUSTR's database as Facility #62000042. A Tier 1 Investigation for Release #62000042-N00001 has been conducted using a previous Targeted Brownfield Assessment Grant. No Further Action status has not been achieved for the Property.

BUSTR's eligibility determination employs the criteria set forth under §101(39)(D)(II)(bb) of the Comprehensive Environmental Response Compensation and Liability Act, as further described in the United States Environmental Protection Agency's "FY14 Guidelines for Brownfield Assessment Grants" (EPA-OSWER-OBLR-13-5). Please note that this eligibility determination by BUSTR does not release any party from obligations under any federal or state law or regulation, or under common law, and does not impact or limit BUSTR's enforcement authority against any person, including an applicant, regarding liability for conditions at the Property.

Based on the information provided by the applicant for the Parcels, and pursuant to applicable laws, regulations and guidance, BUSTR has determined the following:

- The Parcels are of "relatively low risk" as compared with other petroleum-only release sites in Ohio. In addition, LUST trust fund monies are not being used for any cleanup activities, and the site is not subject to a response under the Oil Pollution Act.

- The responsible party required to assess and subsequently clean-up the potential contamination is unknown at this time.

- The Parcels are unlikely to be assessed, investigated, or cleaned up by a person that is potentially liable for the contamination on the Parcels.

- The Parcels are not subject to any order issued under 9003(h) of the Solid Waste Disposal Act.

At this time, under the current property conditions, and based on information provided to BUSTR, the Parcels appear to be eligible for Brownfield funding and Ottawa County has the full support of the Division of State Fire Marshal, BUSTR.

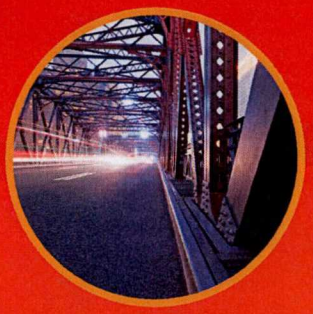
If you have any questions or concerns please contact Christine Pyscher at 614-728-5121.

Sincerely,

Verne A. Ord

Verne A. Ord
Assistant Chief – BUSTR
Division of State Fire Marshal
Ohio Department of Commerce

xc: Site File
Keith Egan, SME



Passionate People Building
and Revitalizing our World

SME